

AGRICULTURAL CHEMICALS

*Serving the
fields of . . .*

AGRICULTURAL
INSECTICIDES

FUNGICIDES

STOCK DIPS
AND SPRAYS

DAIRY FARM
CHEMICALS

FUMIGANTS

WEED CONTROL
CHEMICALS

SOIL TREATING
MATERIALS

SEED TREATING
CHEMICALS

RODENTICIDES

FERTILIZERS

DECEMBER, 1948

No. 12





You are assured on two important points — even in today's abnormal market — when you deal with P. C. A.

1. Quality . . . our Red Indian products are of unquestioned excellence.
2. Service . . . we make every effort to give you the service you want and deserve.

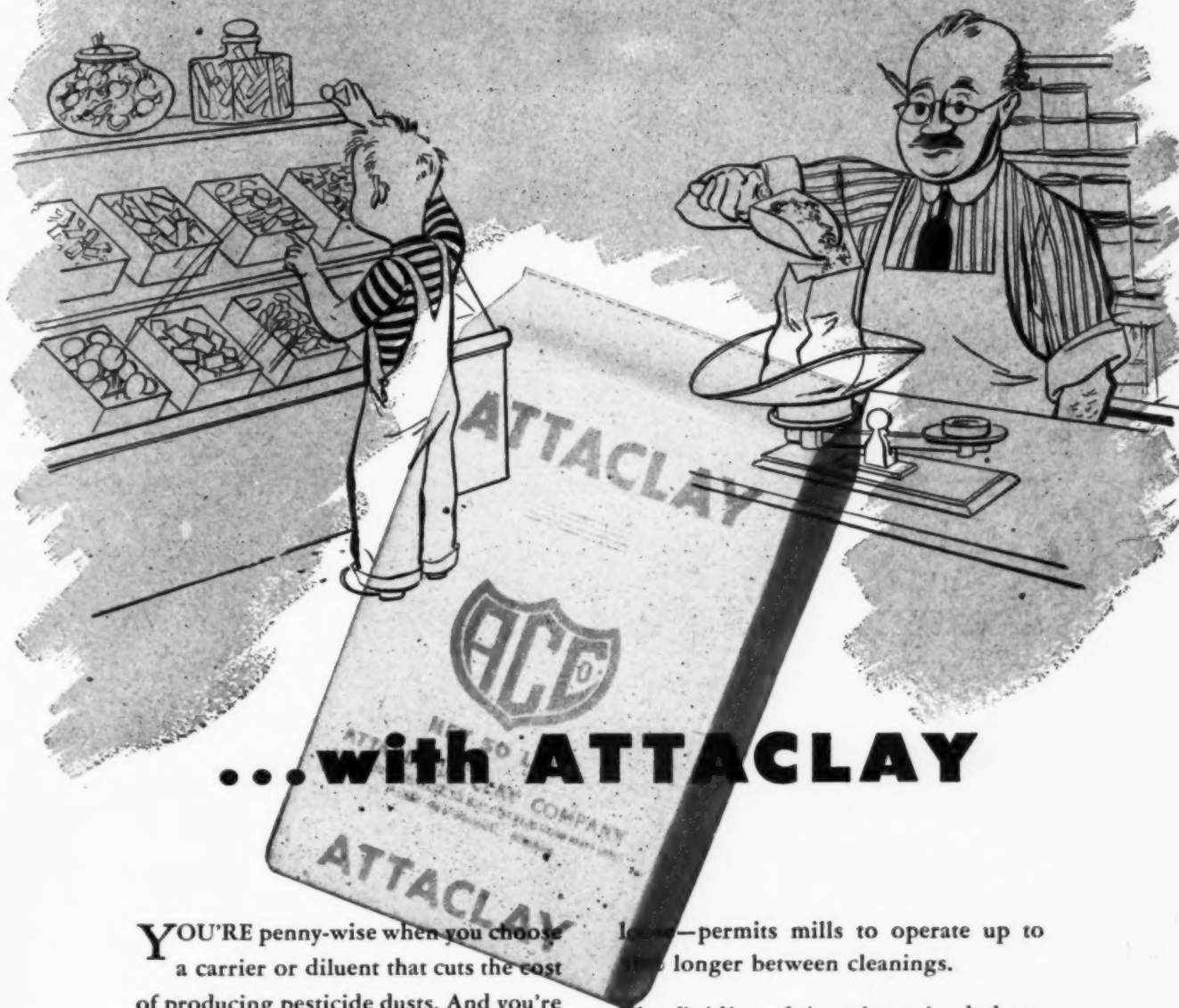
When better service is possible be assured P. C. A. will give it. Meanwhile your confidence, and your patience are greatly appreciated.

POTASH COMPANY OF AMERICA

CARLSBAD, NEW MEXICO

GENERAL SALES OFFICE . . . 50 Broadway, New York, N. Y. • MIDWESTERN SALES OFFICE . . . First National Bank Bldg., Peoria, Ill.
SOUTHERN SALES OFFICE . . . Candler Building, Atlanta, Ga.

Be Penny-wise and Pound-wise, too



...with **ATTACLAY**

YOU'RE penny-wise when you choose a carrier or diluent that cuts the cost of producing pesticide dusts. And you're pound-wise, too, when you select the material which serves to up-grade the quality of every pound of your product. You're *both* penny-wise and pound-wise when you specify Attaclay.

Attaclay's superior flowability keeps dust production moving at a faster pace. It accepts higher percentages of difficult-to-process toxicants. It stays dry and

loose—permits mills to operate up to longer between cleanings.

The fluidity of Attaclay-mixed dusts streamlines packaging operations. And months later, when packages are opened, your product is still loose and lump-free.

Attaclay's record of over-all compatibility is soundly established. Its low bulk density works to your advantage.

We invite you to put Attaclay to your most exacting tests. A generous free sample is yours upon request.

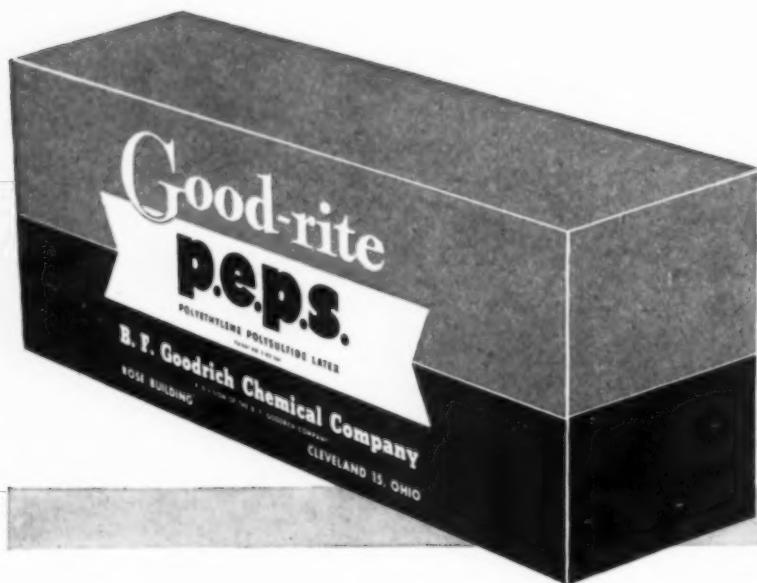
ATTAPULGUS CLAY COMPANY

Dept. P, 210 West Washington Square, Phila. 3, Pa.

Boost your profit line

with

Good-rite p.e.p.s.



**...the new fungicidal adhesive
that sheds rain**

...made in the new, easy-to-use "brick"!

NOW you can add a new money-maker to your line—Good-rite p.e.p.s.

It's the popular new "fungicidal" sticker that keeps sprays from washing off trees, even in heavy rains. It saves money and work. The use of Good-rite p.e.p.s. in many instances makes it possible to use reduced dosages.

Just look at its many advantages: it is *highly adhesive* . . . resists heavy rains that wash off ordinary sprays. It is *widely compatible* with practically all fungicides and insecticides . . . increases their effectiveness.

Non-injurious to fruit and leaves. *Resistant to freezing.*

This new agricultural chemical is basically polyethylene polysulfide. It is made by a brand new process which permits the preparation of a non-injurious and remarkably stable product. And, it's been proved in four seasons' tests . . . is winning more friends every day. Easy to use, too. Each 4-lb. package of p.e.p.s. contains two heavy-foil-wrapped cartridges. Simply unwrap, crumble, dump on screen and wash in with water. Each cartridge makes 400 gallons. Start now to boost your profit line—write today for complete information.

B. F. Goodrich Chemical Company

A DIVISION OF
THE B. F. GOODRICH COMPANY

GEON polyvinyl materials • HYCAR American rubber • KRISTON thermosetting resins • GOOD-RITE chemicals

Rose Building, Cleveland 15, Ohio

AGRICULTURAL CHEMICALS

AGRICULTURAL CHEMICALS



A Monthly Magazine For the Trade

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THIS MONTH'S COVER

Domestic sources of potash have proved to be of extreme value during two war periods and in the current U. S. effort to maintain high production of fertilizer materials. Here is the headframe of the Potash Company of America mine in New Mexico. See article on page 25.

DECEMBER 1948
VOL. III No. 12

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Of the many profitable applications for Santobane (Monsanto DDT), none is more important than its use as a residual spray for the interiors of barns and other farm buildings... Here are some suggestions for keeping cattle free from flies and other insect pests.*

1-Use a 50 per cent DDT wettable powder. For use in hand-operated sprayers, mix at the rate of 2 pounds in 5 gallons of water. The standard strength for power sprayers is 32 pounds per hundred gallons.

3-Applly the spray to the interior of the barn in all parts where flies congregate. Use at the rate of about one gallon to each 300 square feet of surface. Spray all surfaces until they are wet but avoid run-off.

5-Do not spray directly upon feed or into drinking water, but do not be concerned about a small amount of "drift" which may fall upon such materials. DDT will have no ill effects upon livestock or humans when used according to directions.

7-Make the first application at start of fly season and repeat when necessary. One application per year is usually sufficient if combined with a good sanitation program.

Santobane: Reg. U. S. Pat. Off.

2-DDT wettable powder must be stirred or otherwise agitated to prevent it from settling to the bottom of the spray tank. When used in a hand-operated sprayer, it is best to use water and make a thin paste of the powder before pouring it into the tank.

4-Use any kind of a sprayer large enough to efficiently distribute the spray. Use a large aperture disk in the spray nozzle to prevent clogging and to give a coarse, wet spray. Power sprayers should be operated at low pressure (60 to 100 pounds) and should be equipped with a fan nozzle which will give the best coverage when held about three or four feet from the surface being treated.

6-Do not combine DDT with whitewash, but make separate applications, using the DDT last. Whitewash or any other excess material in the spray mixture will "cover up" or mask part of the DDT crystals and thus reduce their effectiveness. The lime in fresh whitewash may also reduce the effectiveness of DDT.

*Extracted from Mimeo. E-12, prepared by the Department of Entomology in March, 1948, as an activity of Cooperative Extension Work in Agriculture and Home Economics, State of Indiana and the U. S. Dept. of Agriculture cooperating.

Manufacturers and formulators of insecticides are invited to send for complete technical data, prices and samples of Santobane. Write Monsanto, Organic Chemicals Division, or get in touch with any District Sales Office.

Ohio tests prove TEPP effective against 17-year locust

Tests conducted last spring in Licking County, Ohio, show that Tetraethyl Pyrophosphate is highly effective in controlling 17-year locusts (periodical cicadas) when properly applied. The mature orchards were sprayed in such a way that mist could readily contact the insects... A small amount of TEPP in water solution resulted in a 90% kill of locusts in the area covered.

This is but another in the growing list of valuable applications for TEPP (Monsanto's Nifos-T) in economical control of destructive insects. For complete application and technical data, formulators and manufacturers of insecticides are invited to contact Monsanto or any District Sales Office.

SANTOPHEN 7 has outstanding advantages as a germicide

Santophen 7 is not only effective in killing germs, but has many other advantages not found in most germicides. It is non-staining and can be readily formulated. Although effective in the presence of organic matter, Santophen 7 is comparatively non-toxic and, in use-dilutions, non-irritating to man and the higher animals. Furthermore, Santophen 7 is general in its germicidal effect (not merely specific toward certain microorganisms).

Reasonable in cost, Santophen 7 possesses additional desirable properties, such as faint but pleasing odor, freedom from corrosive action on metals, stability. Beyond meeting the requirements for modern disinfectants, Santophen 7 can also be used to advantage as an industrial preservative.

Complete application and technical data are contained in Monsanto Technical Bulletin O-3, "Santophen 7, a Germicide and Industrial Preservative." For your copy, write to Monsanto, Organic Chemicals Division.

Nifos, Santophen: Reg. U. S. Pat. Off.



2,4-D controls Johnson Grass in southern cane fields

Sugar growers are achieving higher cane yield and lowering cultivation costs through proper use of Monsanto 2,4-D Sodium Salt.

By applying 2,4-D Sodium Salt to the soil before the germinating seedlings of Johnson Grass emerge, the weeds are killed before they have a chance to start their rapid growth. To make sure of getting crops off to a good start, application should be made the same day cane is planted. Then, if rain follows planting, there is no danger of uncontrolled weed growth before mechanical equipment can be used in the fields.

Other Monsanto 2,4-D formulations provide economical chemical control of many other cane field weeds. For further information and technical assistance in all phases of weed control, address Monsanto, Organic Chemicals Division. Send in your inquiries for 2,4-D Acid, Sodium Salt and Isopropyl Ester.

2,4-D SAFETY NOTES

It is important to dispose of all 2,4-D containers in such a way that they cannot be re-used. Fibre, paper and wooden packages may be burned to eliminate the possibility of use for other products which might become contaminated and thus cause damage to crops. If containers are burned, care must be taken that the wind drift of volatilized 2,4-D is not permitted to contact growing crops.

Niran protects
fruit against
Plum Curculio



Limited production of

NIRAN

(Monsanto parathion)

Monsanto is now producing limited quantities of Niran, the powerful new organic phosphate which promises to assume a most important place in the field of insecticides. Since Niran is highly toxic, every precaution is required in its handling, formulation and use. At this stage, therefore, sales are limited and entirely committed to a few insecticide manufacturers who are skilled in formulation and field application. As more information on the product becomes available, and when production is enlarged, it is planned to expand outlets as much as possible.

In the meantime, inquiries are invited from formulators who are interested in additional information about Niran. Address Monsanto, Organic Chemicals Division.

★ ★ ★

MONSANTO CHEMICAL COMPANY, Organic Chemicals Division, 1766 South Second Street, St. Louis 4, Missouri. District Sales Offices: New York, Philadelphia, Chicago, Boston, Detroit, Cleveland, Akron, Cincinnati, Charlotte, Birmingham, Houston, Los Angeles, San Francisco, Seattle, Portland. In Canada: Monsanto (Canada) Limited, Montreal.



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MONSANTO CHEMICAL COMPANY
Organic Chemicals Division, 1766 South Second Street
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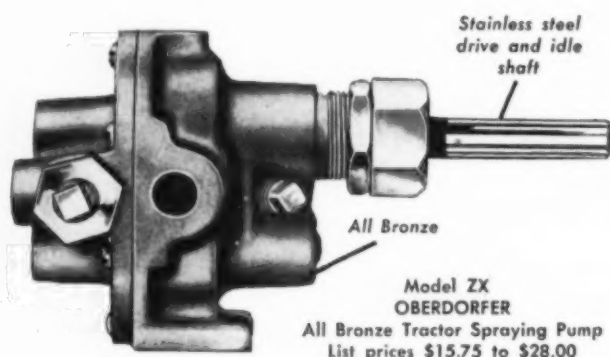
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THERE IS A MARKET FOR **2,685,000** TRACTOR SPRAYING OUTFITS

Low pressure farm spraying is here to stay. The equipment is inexpensive enough for every tractor farmer to own. The spray is cheaply and rapidly applied. It is promptly and surely effective. Yes, low pressure spraying is good farm practice—costly to be without whatever the farmer's crop or livestock.

Profit-minded farm implement dealers should take full advantage of this tremendous new business source. Here is the 1949 potential market for low pressure spraying equipment, based upon the number of tractors in the United States (excluding garden-types) without such equipment.

Alabama	24,000	Maryland	23,000	Oregon	35,000
Arizona	7,000	Massachusetts	18,000	Pennsylvania	111,000
Arkansas	36,000	Michigan	130,000	Rhode Island	2,000
California	86,000	Minnesota	168,000	South Carolina	20,000
Colorado	36,000	Mississippi	28,000	South Dakota	70,000
Connecticut	11,000	Missouri	94,000	Tennessee	33,000
Delaware	5,000	Montana	34,000	Texas	191,000
Florida	14,000	Nebraska	101,000	Utah	10,000
Georgia	40,000	Nevada	3,000	Vermont	9,000
Idaho	25,000	New Hampshire	8,000	Virginia	33,000
Illinois	187,000	New Jersey	22,000	Washington	40,000
Indiana	115,000	New Mexico	13,000	West Virginia	8,000
Iowa	196,000	New York	108,000	Wisconsin	139,000
Kansas	123,000	North Carolina	47,000	Wyoming	11,000
Kentucky	33,000	North Dakota	83,000		
Louisiana	22,000	Ohio	144,000		
Maine	18,000	Oklahoma	81,000		
				TOTAL.....	2,685,000



1. No corrosion with bronze and stainless steel.
2. Pressures up to 150 pounds per square inch.
3. Built-in adjustable pressure relief valve.
4. Lower cost than iron of similar design.
5. No priming to 15 feet below pump.
6. Four large Alemite lubricated bearings.
7. Easily installed by any mechanic.
8. $\frac{1}{4}$ ", $\frac{3}{8}$ ", $\frac{1}{2}$ ", $\frac{3}{4}$ " and 1" standard pipe connections.
9. Backed by 50 years of bronze pump manufacturing.
10. All metal — no rubber.
11. From 2 gallons to 600 gallons per acre.

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for the Veterinary Market...



Chlordane insecticides (emulsions and wettable powders) are preferred by your customers because they are:

- 1 **Effective**—against many of the hardest-to-kill external livestock parasites including sarcoptic mange-mites, most species of ticks, lice, fleas and flies.
- 2 **Pleasant to use**—have a mild, fresh, cedar odor.
- 3 **Safe**—when properly formulated and applied—do not injure or irritate animals, show no tendency to taint flesh.
- 4 **Economical**—material costs range from 1½c a head to about 3c a head per application, depending on size of animals.

Spurred by a strong advertising and merchandising campaign, the demand for Chlordane-based veterinary preparations is increasing daily. Formulators, distributors and dealers in veterinary products are invited to write us for details on use of Octa-Klor* Quality Chlordane in this field.

Julius HYMAN & Company

DENVER, COLORADO

"The Great New Name in Agriculture"

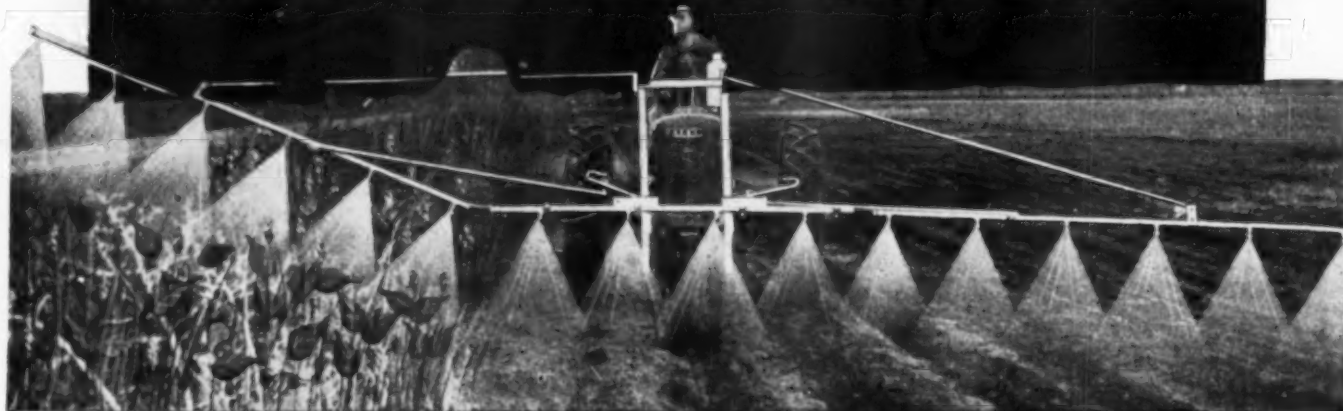


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New York 18, N. Y.

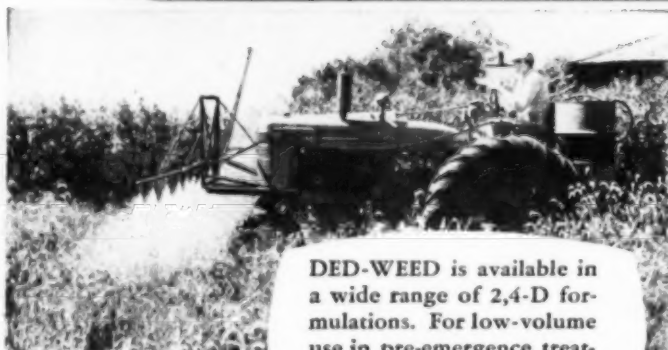
WEST COAST SALES OFFICE
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San Francisco 5, Calif.

*Octa-Klor (Trade Mark Registered U. S. Patent Office) is the brand name of Technical Chlordane produced by Julius Hyman & Company.

When the WEED-KILLING Season Starts...



Can You Supply the DED-WEED* He Wants?



DED-WEED is available in a wide range of 2,4-D formulations. For low-volume use in pre-emergence treatment, row and cereal crop application and general weed and brush control.



THOMPSON-HAYWARD INSECTICIDES ARE SALES-PROVED!

The Mid-West's outstanding insecticides... DED-TOX, DDT insecticide... TOXICHLOR*, Chlordane insecticide... TRI-6*, Benzene Hexachloride insecticide... PHENACIDE, Toxaphene Insecticide.

This year's tremendous sales proved Ded-Weed's merits... and profit possibilities. Expanded sales promotion means even greater sales for the coming season... so play safe... be sure...

*Book Now
for 1949!*

WRITE TODAY FOR FULL DETAILS OF OUR FUTURE BOOKING PLAN



* Reg. U.S. Pat. Off.

THOMPSON-HAYWARD CHEMICAL COMPANY



Photos courtesy of Automatic Equipment Mfg. Co., Keystone Trailer Co. and Bean Mfg. Co.

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A few years ago one of America's leading chemical manufacturers began a thorough investigation of ways and means to cut packaging costs. A change from old packaging methods was indicated.

As a result the company switched to the St. Regis* Packaging System with the following advantages:

- total packaging costs reduced 50% to 70%
- space utilization improved to a marked degree
- easy-to-handle St. Regis Multiwalls won
- immediate worker and customer acceptance.

And this is only one example of how chemical manufacturers have improved their packaging systems. St. Regis may be able to help *you* to greater packaging efficiency and economy.

Your nearest St. Regis sales representative will be glad to discuss your particular problem with you.

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ST. REGIS—WORLD'S LARGEST MANUFACTURER OF MULTIWALL PAPER BAGS

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+ MULTIWALL =

**BETTER
PACKAGING
AT LOWER
COST**

ST. REGIS PACKAGING SYSTEMS



OLIVE OX-WARBLE FLY

BUGTIME *Stories*

by ORBIS

OLIVE Ox-Warble-Fly should have been turned over to the Society for Prevention of Cruelty to Children. Olive just wasn't the Maternal Type. Instead of taking care of her children, the way other mothers do, she laid eggs and then flew away and went about her own business.

One of the worst things about Olive was that she laid her eggs on the hairs of cattle's hides. That was a poor place to leave an egg, since cattle don't like the Ox-Warble-Fly family. Some of the cows on whose hairs Olive deposited eggs gave less milk, lost weight and didn't grow any more. And no wonder! Without Olive, their mother, around the maggots that hatched out of the eggs had nothing else to do but tunnel into the hides of the cattle. They would move around restlessly, under the cattle's skins, looking for Olive. They never found her.

Olive got what was coming to her, however . . .

And not from the Society for Prevention of Cruelty to Children! No, it was an ORBIS Insecticide that did the trick!

ORBIS tested-fresh Insecticides include Rotenone Cube and Derris powders, Rotenone Cube and Derris Resins, Rotenone Crystals C. P., Technical Rotenone and an interesting variety of DDT products.

There's an ORBIS Rotenone or DDT compound that will fill the bill for *your* compounding problems.

FULL INFORMATION ON REQUEST.

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ROTENONE
CONCENTRATES

MEMPHIS, TENN.

**NOW—
larger commercial
quantities of
High Gamma BHC**

**PENCO
HI-GAM* W-25**
another Pennsalt development

LESS ODOR • LESS TASTE

Penco Hi-Gam W-25 is a wettable spray powder containing 25% of the essentially pure gamma isomer of benzene hexachloride as the active ingredient. This new, powerful insecticide can be used either as a dust base concentrate or in water suspension spray.

Features of PENCO HI-GAM* W-25

High gamma isomer content requires less BHC for formulation resulting in:

- ➔ **Reduced odor**
- ➔ **Greater safety on crops where use of BHC is recommended**

Penco Hi-Gam W-25 meets the requirements for high gamma content BHC needed in special formulations.

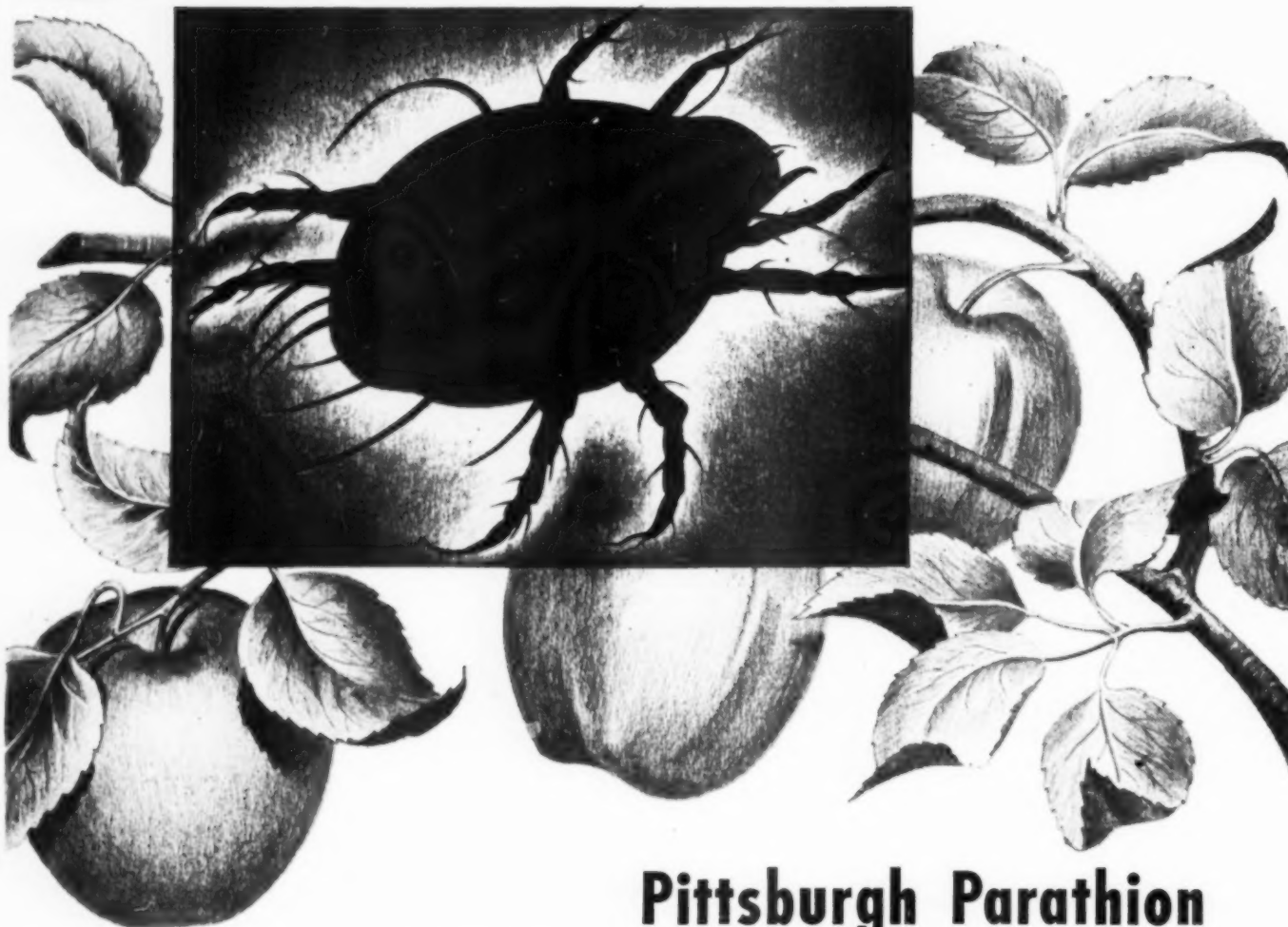
For further information on this and other quality agricultural chemicals, write: Agricultural Chemicals Division, Pennsylvania Salt Manufacturing Company, Philadelphia 7, Penna., Tacoma, Washington or Bryan, Texas.

*TRADE MARK P.S.M.CO.



agricultural chemicals

Banish this undesirable alien!



Pittsburgh Parathion

destroys the European Red Mite

Parathion is a new addition to the expanding *Pittsburgh* line of agricultural chemicals. With the development of *Pittsburgh* Parathion the company becomes one of the few basic producers of this acaricide. It is probably the most potent insecticidal chemical known to science.

Pittsburgh Parathion is produced in technical grade, 25% dust concentrate and 15% wettable dust concentrate, chemically and biologically standardized. It is available in bulk ready for mixing.

In addition to its effectiveness in controlling the European red mite and other arachnids, *Pittsburgh* Parathion is lethal to a wider range of insect enemies than any other compound now in general use. Full technical information is available in bulletin No. 106.

Your inquiries about this or any other *Pittsburgh* chemical are invited.

Other "Pittsburgh" Agricultural Products

2,4-D Acid—Amines—Esters

Sodium Thiocyanate

BHC (Benzene Hexachloride)

Technical and Formulation Concentrates

DDT (Dichloro Diphenyl Trichloro Ethane)

Technical and Formulation Concentrates

DNOC (Dinitro Ortho Cresol)

ANTU (Alpha Naphthyl Thiourea)

Chlordane Concentrates

HETP TEPP PARATHION

(Organic Phosphate Insecticides)

Paradichlorobenzene

Orthodichlorobenzene

Phenol Disinfectants



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What makes a livestock and dairy spray **SELL?**



Rapid Action!



Residual Protection!



Safety!

You get all three—

when your oil-type spray is based on

Pyrenone 20 New

And remember — demand for oil-type sprays is increasing all the time. Be ready to meet it—and boost your sales — with insecticides based on effective, economical Pyrenone 20 New.



INDUSTRIAL CHEMICALS, INC.

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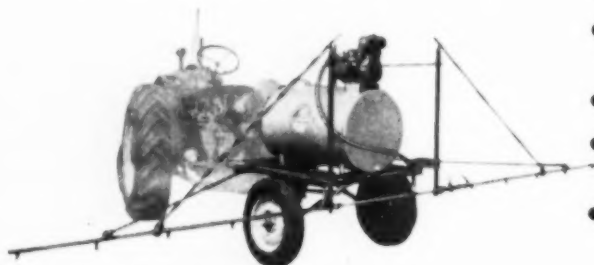
IN CANADA: Standard Chemical Co., Ltd., 99 Vanderhoof Avenue, Leaside 17, Toronto, Canada

DECEMBER, 1948

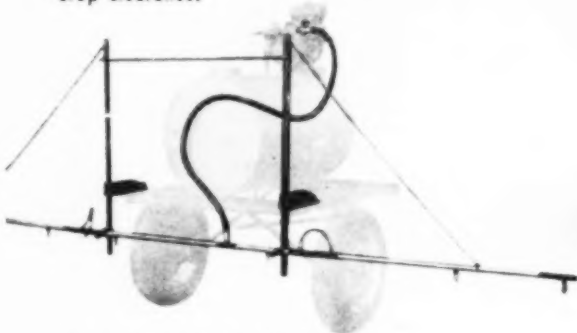
YOU ASKED FOR IT-HERE IT IS



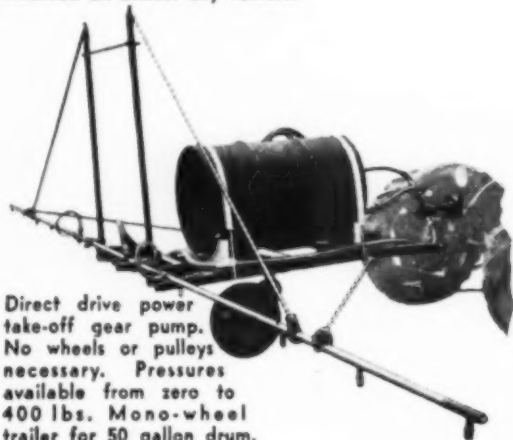
50 gallon self-contained unit with 22 foot Resisto-Rust superior boom—stainless steel with cadmium and galvanized parts. Mounted on our mono-wheel trailer.



100 gallon self-contained unit mounted on Hi-X trailer for row crop clearance.



Utility 15 and 22 foot boom in the very low price bracket but value through and through. Can be mounted on almost any vehicle.



Direct drive power take-off gear pump. No wheels or pulleys necessary. Pressures available from zero to 400 lbs. Mono-wheel trailer for 50 gallon drum.

We asked hundreds of agricultural chemical and equipment dealers what their customers expected in their new spraying equipment—what they liked and didn't like about equipment in general. The exclusive features in Howard Hanson spraying equipment deliver just the kind of improved performance and extra service you dealers asked for. Hanson sprayers and booms are engineered to sell so it will benefit dealers to carefully examine the outstanding features built into our equipment.

YOU ASKED FOR THESE FEATURES—HERE THEY ARE!

- A self-contained sprayer pump and tank unit.
- A power take-off unit.
- Units capable of highest pressures.
- Units with large capacity.
- 50, 100 and 200 gallon capacity tanks.
- Completely galvanized tanks—no rust problem.
- Tanks are round in shape.
- Pump and motor are mounted on top of tank.
- Solution is kept in constant agitation.
- Pump and tank unit quickly demountable from trailer.
- Booms are rigid construction—no sway trouble or wobble.
- Booms swing both ways.
- Booms are completely adjustable for any spraying job.
- Row crop attachments—easily fastened to regular boom.
- Special boom for wheat spraying.

For further information write direct to Howard Hanson & Co., Beloit, Wis.

THERE'S A HANSON AGRICULTURAL CHEMICAL TO FIT EVERY INSECT OR WEED CONTROL PROBLEM

HOWARD HANSON & CO. BELOIT, WISCONSIN

**FOREMOST IN COMBINED CHEMICALS
AND EQUIPMENT FOR AGRICULTURE**



200 gallon self-contained unit with 35 foot Resisto-Rust sulky boom.

ANNOUNCING A NEW SOURCE OF SUPPLY FOR

Zinc Chloride Zinc Sulphate

Now being produced in a large and completely modern plant, using only the latest and most up to date equipment. Write today for detailed information, samples and prices.



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**are the perfect conditioner for
Chemical Fertilizers**

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- ✓ Available in fine ground No. 16, medium ground No. 14 and coarse ground No. 12.
- ✓ Used and preferred by leading fertilizer manufacturers.
- ✓ Available in large volume the year 'round.
- ✓ Shipped in bulk or 100-pound burlap bags (25 to 40 tons per car).
- ✓ Very inexpensive.
- ✓ Wire, phone or write for free sample and price.



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ARKANSAS RICE GROWERS CO-OP ASS'N.
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*World's largest rice growing, milling, storage and marketing organization.
World's largest year 'round supplier of rice hulls to fertilizer manufacturers.*

THE EDITOR COMMENTS

SIGNIFICANT indeed is the comment elsewhere in this issue that the destruction of the German potash and fertilizer industries during World War II was one of the basic factors in Germany losing the war. The lack of fertilizer materials so crippled European agriculture that the yield per acre was reduced beyond the point where the land of Germany and the conquered countries could feed their populations. Lack of food accelerated the collapse, and that lack was due basically to lack of chemical plant food.

If the facts as outlined in this story of the food situation in Europe during the war could be brought strongly before every member of Congress, we doubt that thoughts of government fertilizer manufacture in competition with private industry would receive much favorable consideration. The vital necessity of a strong fertilizer industry,—one not subject to potential undermining by government competition,—becomes almost glaringly apparent. We in the U. S. do not know what it means to be really short of plant food, for during the war our industry met every demand made upon it, just as it has been doing since the end of hostilities. In Germany, we see that when their fertilizer industry collapsed,—the cause, enemy bombing, being incidental,—virtual collapse of their economy followed in due course.

As we see it, the lesson of Germany applies directly and specifically to the United States too. We need a strong fertilizer industry. It is vital in war or in peace. And no government agency should be permitted by Congress to do anything which will weaken it today and possibly destroy it some years hence. And that is exactly what government in the fertilizer business could do. If for no other purpose than to insure this country an uninterrupted supply of plant food in years to come, government projects should be turned over to industry and further forays into fertilizer manufacture by government should end. A permanently strong fertilizer industry cannot be maintained always

in the face of the threat of growing government competition. The war emergency has ended; government fertilizer operations should end with it.

VALUABLE background information on the development of new pesticides is being distributed currently by the Agricultural Insecticide and Fungicide Association. Some points which could well be amplified to the trade, as well as to users of agricultural chemicals, are contained in the information.

Problems created by the use of new organic pesticides including those of dosage, timing, toxicity, methods of application, drift and residues are brought out by the Association, which also notes that encouraging progress is being made through intensive research by industry and federal and state agencies. At the same time, the Association reminds that there are many long-used chemicals for pest control, the merits of which should not be overlooked. The merits and weaknesses of older toxicants should be compared to those of the newer ones in selecting a product for a given job.

Need for a positive approach to the over-all problem is emphasized. It is pointed out that much of the adverse pesticide publicity appearing in the press has discussed the problems to the exclusion of mentioning the great benefits of pest control. Some articles have intimated that a given insecticide is too dangerous for handling by anyone under any circumstances,—and such attacks have not been limited entirely to the newer organics.

On the other hand, the role of certain newer pesticides has been exaggerated by newspaper articles to the extent that the public has demanded quantities of these new materials, has used them for many purposes for which they were not suited, and was inevitably disappointed when because of misuse, the new products failed to perform according to newspaper ballyhoo.

Despite these unfortunate happenings, chemical pesticides have been proved vitally essential to the efficient functioning of modern agriculture. They are here to stay, and their use unquestionably will continue to increase. Full utilization, however, is dependent upon knowledge of *limitations* as well as benefits; and also upon a recognition of hazards involved. This makes it clear that education is *imperative*, particularly education for the user. Once such information is common knowledge, the clamor for restrictive legislation will quickly pass. Upon the dealers and distributors of pesticides rests a major portion of the responsibility for instruction in proper use. Their knowledge must be passed on to the ultimate benefit of the entire industry.

ANNOUNCEMENT of an expanded scope of operation has been made by the Agricultural Insecticide and Fungicide Association. The new policy which involves enlarging the membership to include custom operators, equipment manufacturers, suppliers, allied industries, scientists and dealers, is expected to consolidate much of the diversified work being done in the pesticide field. It should bring into focus all of the widely separated knowledge now held by the industry.

In keeping with the more comprehensive coverage of the industry, the group's name is being changed to "National Agricultural Chemicals Association," with headquarters soon to be established in Washington, D. C.

The move culminates a long-felt and increasing need for industry-wide cooperation in the solution of problems affecting the welfare of the entire group. Problems which puzzle the airplane applicator, for instance, are of direct interest to manufacturers of spray nozzles or to makers of dust diluents. How these problems are solved affects indirectly the entire industry for profit or loss. The over-all welfare of the pesticide industry is inter-related to all of its branches. To witness the various segments of the industry uniting in one association to work out mutual problems, is gratifying.

That the entire agricultural chemical industry welcomes the launching of the National Agricultural Chemicals Association, goes without

saying. At any rate, our hat is off to the idea, and our sleeves are rolled up to aid. The transformation of AIFA into NACA is the beginning of a new era in the agricultural pest control world.

DEMAND for farm products is expected to continue strong in 1949, but net farm income may taper off a little from the record 30 billion estimated for 1948, according to the USDA Bureau of Agricultural Economics. The Bureau predicts that rising living costs may reduce the net farm income, but despite this, "... in 1949, higher income families probably will continue to improve their living."

A discussion of higher costs to farmers and the subject of agricultural chemicals should hardly be mentioned in the same breath, for it is notable that prices for such chemical products have not increased to any extensive degree during the current inflationary period. The fertilizer industry, for example, is justifiably proud of its record of keeping prices down during both the wartime and post-war periods. While farmers are now receiving about three times the average index figure for the 5 year pre-war period (1935-39), the prices they pay for fertilizer have advanced only about one-half.

Interesting to note, also, is that although prices farmers pay for all commodities have increased from an index figure of 125 (1935-39 average) to 250 in 1948, prices for fertilizer have increased only from 100 to 155 during the same period. Qualitatively, the price figures do not take into account that post-war fertilizers are averaging about 15 percent higher plant food content than the pre-war grades.

Pesticide prices have also remained remarkably stable, which has been a factor, no doubt, in the increasing use of these materials, and the increasing dependence of growers upon the use of insecticides, fungicides and herbicides.

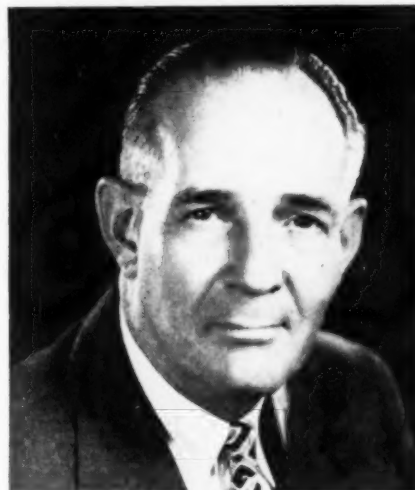
In view of the small cost of chemicals for agriculture, in comparison to their benefits, and the fact that the value of their use has now been thoroughly demonstrated under nearly every condition, it is obvious that American agriculture today is completely "sold" on use of farm Chemicals.

Guest Editorial written especially for
this issue of Agricultural Chemicals.

Pesticide industry recognizes, seeks solution to new problems

by
A. W. Mohr

President, California Spray Chemical Corp.
Richmond, California



R ESEARCH in the field of agricultural chemicals has accomplished more in the past few years than in the previous two or three decades. Since the war, the industry has made available many new and tremendously more effective insecticides, fungicides and herbicides.

Introduction of these products has had a great impact on the industry, on the agricultural specialists of the Government, the States and the Universities, also on the food processing and canning industries and especially on the American farmer.

Rightfully so, there has been much concern on the part of all interested parties and by the industry in particular, as to the far-reaching effects of the new materials. Those experienced in the industry are fully conscious of the problems involved and have done a vast amount of experimental work to determine the use limitations, the safety and precautionary measures and antidotes before placing a new material on the

market. In addition to test work by industry, many other agencies have done a great deal.

Last year the new federal insecticide law went into effect and the Government officials in charge have very properly demanded extensive test work and conclusive proof before permitting registration of new products. Where doubts have existed on the question of usage, they have limited the usage to those products which have proven safe. This Federal safeguard has helped to curb the enthusiasm of persons inexperienced in the field who have wished to move too fast.

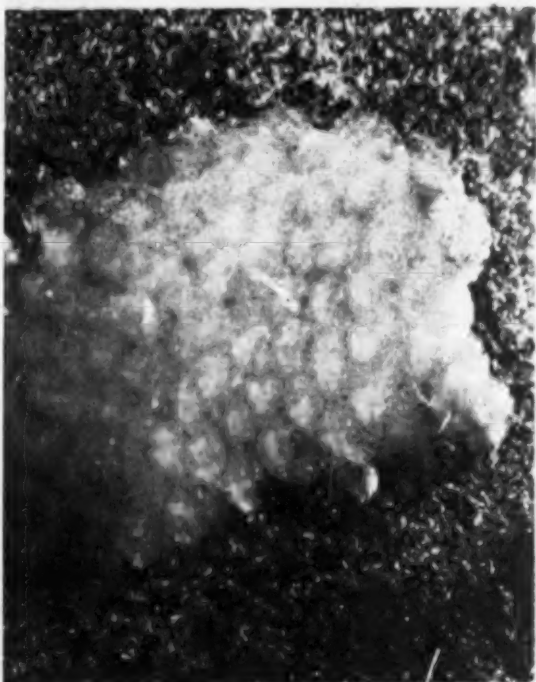
The new products offer many advantages which include better control, lower dosages, fewer applications, salvage of some crops for which there was no known control, increased yields, better quality crops and lower pest control cost to the grower.

During the past year there has been an increasing amount of "scare" publicity about possible detrimental effects of the new chemicals. In the future, it is hoped that before

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Red-banded leaf roller moth resting on apple leaf. (Upper Left)



Enlarged egg mass on apple bark. (Left)

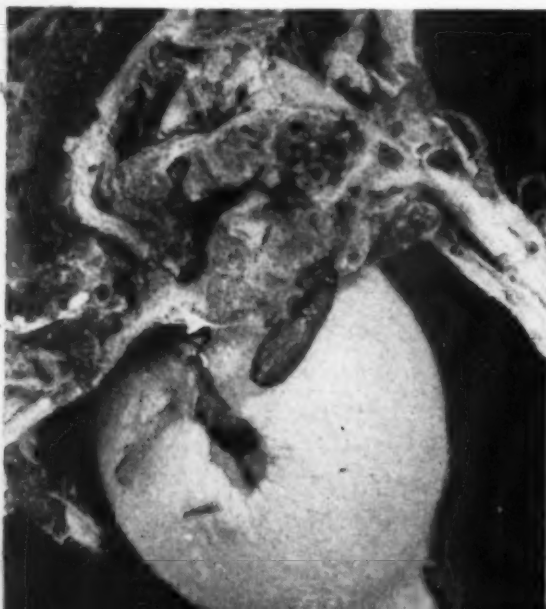
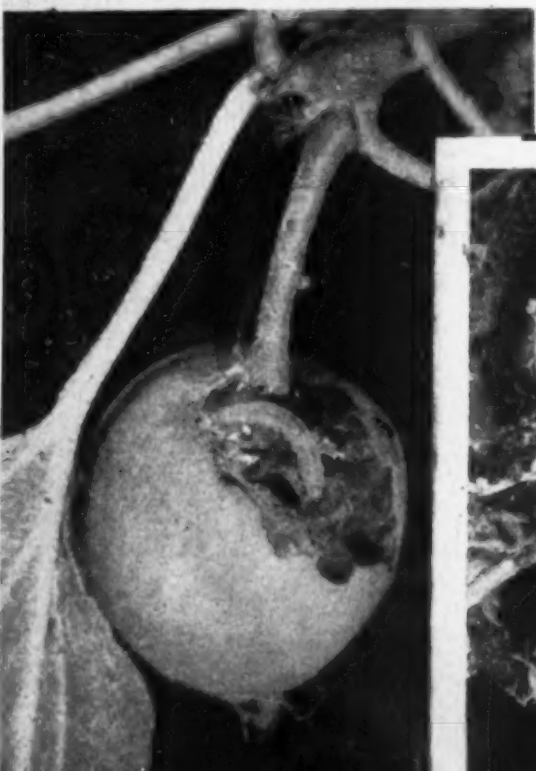
First generation larva feeding on young fruit. (Lower Left)

Pupa attached to remains of injured leaves and fruit. (Lower Center)

Feeding injury by first generation larvae on watersprout. (Lower R.)

IN many sections of the eastern and northeastern fruit areas, the red-banded leaf roller, *Argyrotaenia velutinana* Walker, has become the fruit growers' "Insect Enemy Number One." Although a native species, it has jumped to prominence in the past two years. Several theories have been advanced for the upswing of this pest, including reduction of parasites from the use of DDT and the change in spraying practices from the application of DDT for codling moth control. The fact remains, however, that the red-banded leaf roller is now one of the most important insect pests of apples in the northeast.

Two generations of the leaf roller are to be found under New York conditions. Overwintering pupae in the trash and debris beneath the trees give rise to the early season moths. They appear on the trunks and large scaffold limbs of apple trees about the greentip stage which in 1948 came late in April. Eggs deposited in flat, pale yellow masses can be found on the bark of the larger limbs. The first generation caterpillars feed on the lower surface of the leaves along the midrib. Terminal growth on watersprouts inside the tree is



particularly attractive to the developing larvae. The webbing and mining of the leaves is particularly noticeable as first generation larvae reach maturity. Fruit injury may be severe on some varieties from the large worms of the first brood.

Pupation takes place on the tree in webbed, injured leaves and along side an injured fruit where leaves may have been fastened to the side of the apple.

The moths of the second generation deposit their eggs on the upper surface of the leaves, particularly on the small leaves on fruit spurs where they are likely to go unnoticed. Commencing early in August, newly hatched larvae feed in mines on the under sides of the leaves. When partially grown, they move rather suddenly to the maturing fruit. From this time until harvest extensive fruit injury develops. The feeding of the caterpillars on ripening fruit causes a hastening of formation of the abscission layer and a premature dropping of the fruit. Larvae drop on silked threads from leaves and branches to continue feeding on fallen fruit until they mature. A complete loss of an apple crop from a heavy

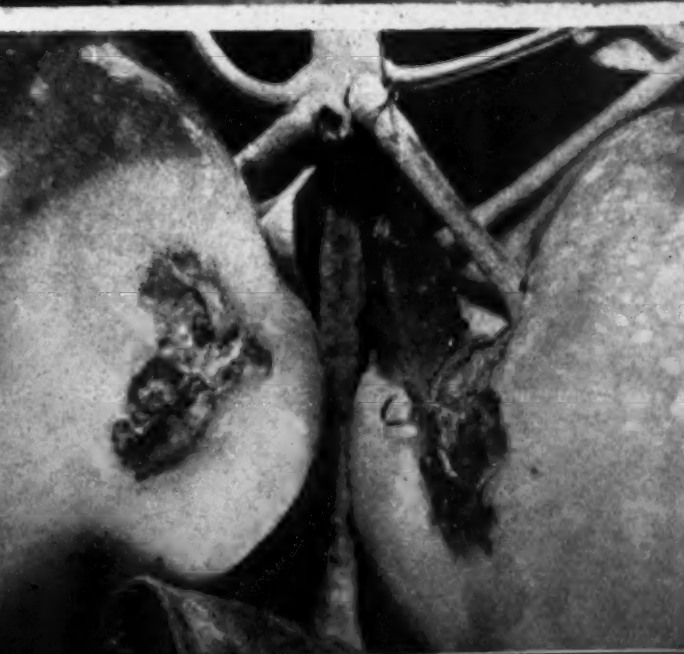
Apple leaves with characteristic larval feeding injury. (Below, Left)

Developing fruit separated to show first generation feeding injury. (Below, Right)

Typical injury on a single apple caused by late feeding of second generation larvae. (R.)

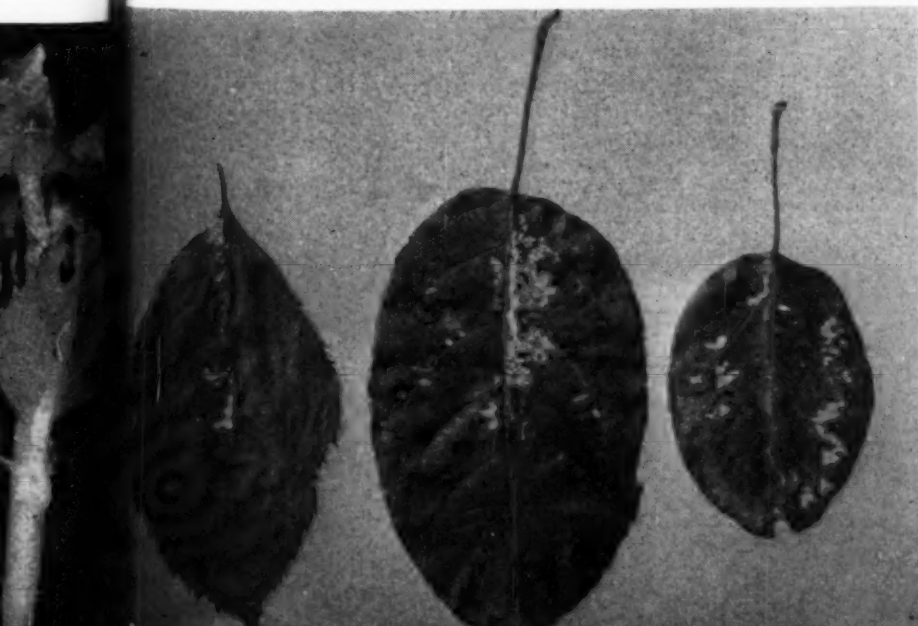
A basket of dropped fruit picked from beneath the tree. (Above, Right)

Premature drop of the crop due to the feeding of larvae on the fruit surface. (Above, Right)



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infestation of the red-banded leaf roller is possible.

Control Measures

THE control of this pest involves careful consideration of several factors. One must remember the most important aspects, including:

1. Pruning trees to permit a thorough job of spraying from the inside as well as outside of the tree.
2. Emphasis must be placed on covering the undersides of the leaves.
3. Time sprays to hit the newly-hatched larvae since they are

easiest to kill with insecticides.

4. Select an insecticide that will be effective; there appear to be several that will do the job when properly timed and applied.

Credit is due Mr. Gere Kruse for the photographs used in this article. The black and white prints were made from kodachrome slides. Duplicates of these slides are available for purchase from the Department of Extension Teaching and Information, Cornell University, Ithaca, New York, Attention, Mr. E. S. Phillips.

"Specialization" in New Organic Insecticides

By Dr. Stanley W. Bromley

Chief Entomologist, F. A. Bartlett Tree Research Laboratories

INSECTS have been specialists for millions of years. They exercise a high degree of selectivity. Because of this trait they have forced the insecticide manufacturer, the chemist, the research worker and the entomologist into a high degree of specialization.

Here are some examples of insect specialization:

The common forest tent caterpillar will attack the sugar maple and the oak, and leave the red maple completely alone. Why? Looking further, we find that the tulip scale is wholly indigenous to the tulip tree. The white pine bark louse is found only on the white pine. The elm bark louse will touch no other tree than the elm. Even the pine needle scale selects only a few types of the two-needle pine group—the Scotch, Austrian, Mugho and Corsican pine.

Aphids are perhaps the greatest specialists of all in the insect world. The spruce gall aphid, for example, chooses only the Norway spruce. Yet it will not attack all Norway spruce. Why one Norway spruce is impervious to the aphid while another growing not too far away falls prey to the insect is still a mystery to entomologists.

Cinari Pini, the two-needle pine aphid, is found only on the Scotch, Austrian and Mugho pine, all two-needle pines. *Cinari Strobi*, another aphid, confines its attack exclusively to the five-needle pine

group of which the white pine is the most familiar member. The five-needle pine aphid refuses to poach on territory belonging to the two-needle pine aphid. Conversely, *Cinari Pini* by some unknown division-of-labor or division-of-habitat agreement will not cross over into the *Cinari Strobi* area.

No one knows why insects observe this degree of selectivity or specialization. It is possible only to guess that it may be due to the chemistry of trees themselves. Entomologist and tree workers, however, are concerned with the control of these pests in their day-to-day work. Specific insecticides, we have found, must be used on specific insects to be effective.

With all the array of new organic insecticides on the market, one would suppose that the problem of pest control would be nearly, if not completely, solved. But that is certainly not the case, for each new insecticide regardless of its "billing," creates its own new problems: the control of those insects which it fails to kill and thereby fosters or builds up; and the danger of its causing plant injury.

There is a grave danger in trying to adopt any single insecticide as an over all panacea, for there is no such product. The specialization of the insects themselves would seem to preclude even the possibility of such an insecticide in the future.

Not long ago DDT was be-

lieved by many to be the panacea. During the past few years we have learned, sometimes at great cost, that it is a specific for certain specialized purposes. On the Bartlett laboratory grounds where it has been used extensively for some six years, the writer believes it has done more harm than good.

DDT is the best insecticide for controlling large outbreaks of such pests as the gypsy moth. No other material has been found to do the job as well at a comparable cost. But at the same time, it has serious drawbacks when applied for general use, because it permits the increase of red spider, certain aphids, lace bug, scale, bagworm and the locust leaf miner.

A number of new insecticides have been offered to offset such shortcomings of DDT. Here are a few, well known to the trade:

1. Benzene hexachloride kills many insects which DDT does not control. Yet its characteristic musty odor which tends to linger when it is used around buildings or on ornamental trees near a home is objectionable. Because of this odor benzene hexachloride may not become too popular in use.

2. "Toxaphene" is a specific for bagworm control. But it is ineffective in control of Japanese beetle as compared with DDT.

3. Parathion controls practically all insects which DDT does not. But it also possesses an odor which many consider objectionable. Because of this, its use around flower gardens may be inhibited.

4. Chlordane is a specific for grasshoppers and ants. It is somewhat toxic to ornamental plants, but excellent in grub proofing. For this work, however, it does not compete with DDT in cost.

5. "Styx" is in many respects a promising insecticide. A pyrethrum-rotenone emulsion, it was developed before the war. During the war it was difficult to obtain some of the ingredients necessary and with the advent of DDT it was believed that "Styx" might be forgotten. But it was not. Instead, "Styx" has re-

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POTASH

- Its Role in the

FERTILIZER

industry

AWARENESS of the value of potash to American agriculture, and in turn to the national economy, had its beginning nearly 40 years ago when the U. S., with a single foreign source of supply, began to realize that this source might some day be cut off. Such fears proved to be well grounded when Germany, the only supplier, became entangled in World War I.

The Kaiser had looked for a long war, and reasoned that a potash starvation in the U. S. would cut food supplies enough to render the nation helpless. He and his advisors, however, had neglected to recognize U. S. steps already taken toward a potash self-sufficiency; the U. S. Government having encouraged exploration over a wide area for potash-producing materials.

With the abrupt termination of German importations in 1914,

prices advanced from \$35 to \$500 per ton of 50 percent muriate. This pressure brought under industrial development nearly all of the potash-bearing raw materials (and industrial wastes) which had been listed from the previous Federal surveys. The result was the construction of 128 production units, with an output of 209,000 tons of salts, containing 54,800 tons of K_2O by 1918 and a rated but unrealized capacity considerably in excess of that.

Because of the emergency nature of the development, technological research was largely eliminated, resulting in the extraction of potash by "main force and awkwardness." Thus, when German potash

again appeared on the American market at a carefully regulated descending scale of prices, the American wartime industry faded away, with only three of the original units surviving to recent years.

But potash research continued in the U. S. and as the result, one of the enterprises that survived the post-war deflation in potash interest developed its processes competitively to become a major factor in potash production—the American Potash and Chemical Corporation. Since that time, beginning with the extraction of potassium chloride from the complex brines of Searles Lake, California, persistent research and development has brought it to its present rating as one of the outstanding chemical achievements of the U. S.

This plant was the first to utilize large scale application of the vacuum-cooling crystallization of po-

Product storage building at the mine of International Minerals & Chemical Corporation. Building is 110 feet wide and 600 feet long. Note its size compared to station wagon beside structure.



tassium chloride yielding a product of 97% purity, which established "60% muriate" as the standard potash grade.

Up to 1926, surveys for the search for potash resources had been restricted to "surface aspects" of the problem, outcroppings of potash minerals, the less pure strata of sodium chloride in salt mines already opened, and subterranean brines from salt springs and oil wells. No funds had been provided for the additional exploration of the great saline deposits of the nation, even though it was well known from German explorations that potash deposits were often associated with them. Conspicuous and least explored among these salt deposits was that of the vast Permian Basin underlying parts of Texas, New Mexico, and the states to the north.

It was in this area of Texas that potash salts were found in solution. Then followed the discovery of fragments of crystalline potash minerals, indicating the occurrence of potash segregations in the saline strata penetrated by the borings.

On the basis of such meager evidence, a bill was introduced in the Congress in 1924, authorizing investigation by the United States Geological Survey to determine lo-

cation and extent of potash deposits in the United States. This bill became law in 1926 through the perseverance of its proponents.

Under this authorization between 1926 and 1931, 24 core tests were drilled, 10 in Texas, 13 in New Mexico and 1 in Utah. Beds of potash salts considered to be "of possible commercial interest" were encountered at depths of from 373 to 2737 feet, varying in thickness from 1 ft. 6 in. to 8 ft. 10 in. and in potash content of from 9.12 up to 13.94 percent K_2O .

The drilling procedure made use of the plunger type of drill through the overlying rock strata until the saline strata were encountered, whereupon the diamond core drill was substituted. With the use of saturated saline solutions as lubricants, complete cores of the saline strata were recovered and their content of potash minerals identified and analyzed. This activity and the related publicity which preceded it alerted oil-drillers so that the Snowden and McSweeney Oil Company, exploring for oil in the neighborhood of Carlsbad, New Mexico, discovered

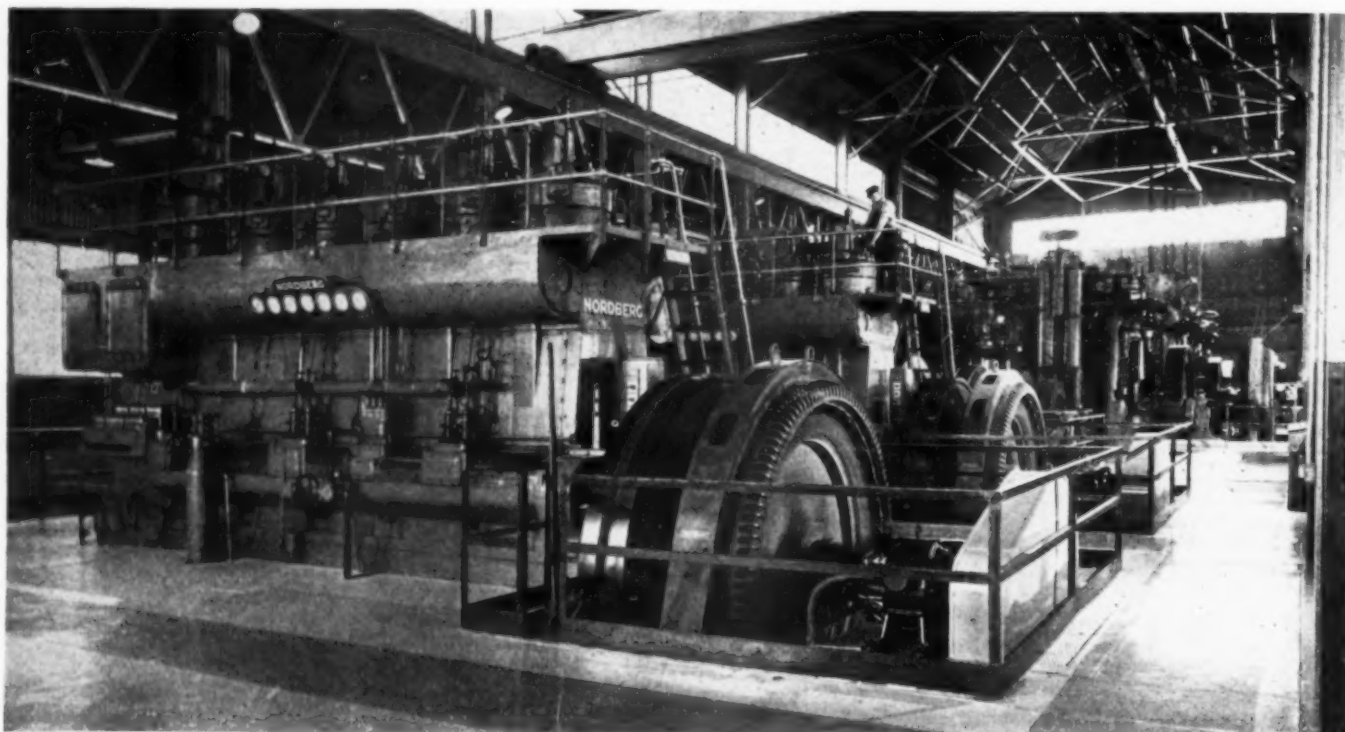
Power plant at International Minerals & Chemical Corp. mine. With all operations electrified, the potash mines use large quantities of electrical power.

a potash deposit as the result of the first core test for potash beginning April 14, 1926. This deposit, at a depth of only 1,000 feet, left no doubt about its entire commercial value. Further exploration to determine its lateral dimensions revealed it to be equal to the best of the European deposits. Among the several strata of water-soluble potash minerals penetrated was the bed of sylvinite, a natural mixture of sylite, (potassium chloride) and halite, (sodium chloride) containing 21% K_2O , which was destined to become a major source of potash for American agriculture.

Mine Developed

IN the development of a potash industry based on this deposit, the United States Potash Company was the first to enter this field. With production beginning in 1931, it became the American pioneer in the mining and refining of a raw material from such a source.

Then followed in the same field the Potash Company of America (organized in 1936) with a mine thoroughly mechanized and a refinery built to apply the flotation process . . . the first industrial application of the familiar flotation principles to a water-soluble ore. This was fol-



lowed in turn by the mine and refinery of the former Union Potash and Chemical Corporation, subsequently amalgamated with the International Minerals and Chemical Corporation, again with a mechanized mine and a refinery employing flotation methods in part of its operation. These four companies are the major factors of the American potash industry today.

Intermediate in scale of production is the plant of Bonneville, Ltd. near Wendover, Utah, where the raw material is a brine found in the clay stratum underlying the salt crust covering the Bonneville Flats or Salduro Marsh of the Salt Lake Basin. Here solar evaporation is employed to yield a mixture of crystalline and potassium sodium chlorides, subsequently separated by flotation.

In more recent years, Dow Chemical Company, Midland, Michigan, has become a producer of high-grade potassium chloride as a by-product of its processes employing the natural brines of that State as the raw material.

While steadily increasing their capacities, the major producers have added other chemicals to their list of products and thus have effected

a diversification and full utilization of the constituents of their raw materials. Outstanding in this respect is the American Potash and Chemical Corporation with a list of products that includes potassium chloride of some 98% purity designed for the fertilizer trade.

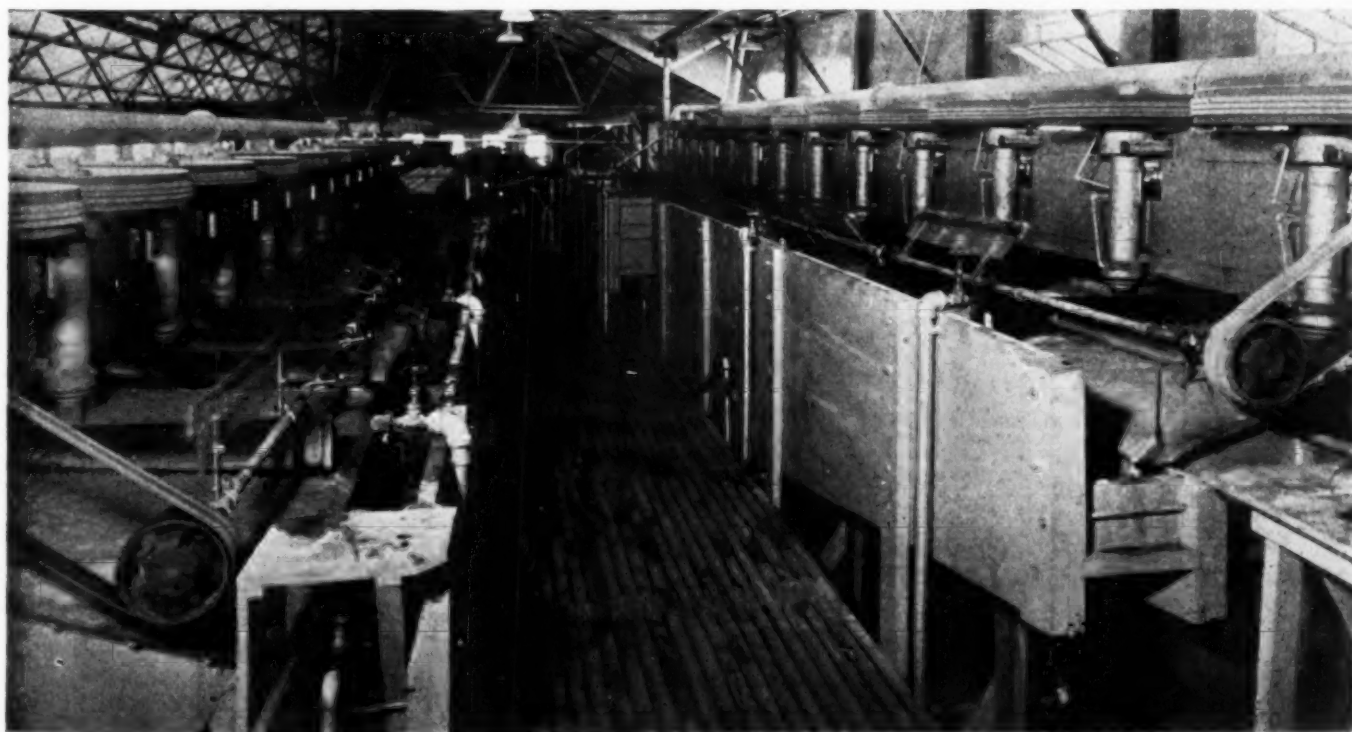
The potash ores of the Carlsbad area are too free from impurities to permit such an array of products; yet under production are potassium chloride of several degrees of purity and crystal size, 60% muriate, 50% muriate and 22% run-of-mine salts, potassium sulfate, sulfate of potash magnesia, and potassium chlorate.

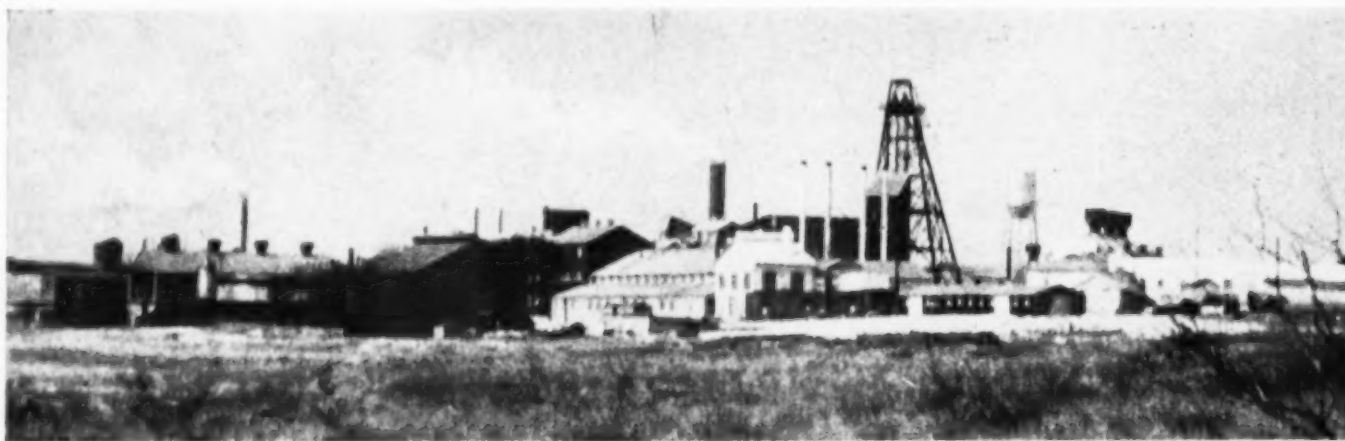
The industry by 1935 had reached those production levels where it felt itself justified in participating in the scientific research and educational activities long supported by the potash importers with enviable success. Accordingly, in that year the American Potash Institute was organized with an experienced staff designed to conduct the agronomic, editorial, chemical, and economic purposes and activities in the agricultural field. The Institute main-

tains research fellowships in the leading agricultural research centers of the United States and disseminates a large volume and diversity of educational literature dealing with the profitable use of potash in agriculture.

With these developments, the advent of World II in 1939 found the U.S. in a tremendously improved situation with respect to potash supplies as compared to the critical and near-disastrous dearth in 1914. Considerable skepticism greeted the announcement in 1939 that the American potash industry was then prepared to take care of the Nation's potash requirements, for it was known that up to September of that year a considerable percentage of our potash requirements were being imported. What was not so generally known was that a substantial proportion of American production was being exported. This tonnage could and would be diverted back immediately into the domestic market. Nor was it generally known that large expansions in production capacity were underway; that great reserves of unrefined run-of-mine salts were readily available to equal any deficit in the refined salts that might develop; and that production of potassium sulfate, formerly largely

Concentrating raw potash by flotation process in Potash Company of America plant, Carlsbad, New Mexico. (Photo courtesy American Potash Institute).





General view of mine structures, headframe and residential buildings of Potash Company of America mine.

imported, could and would be promptly expanded.

As recently as 1938 the U.S. was still importing 65,000 long tons of potassium sulfate from Europe. At that time some production from the interaction of potassium chloride and sulfuric acid was under way. This conversion was promoted by the Potash Company of America in collaboration with producers of salt cake, potassium chloride being substituted for sodium chloride in that process. Later the American Potash and Chemical Corporation entered upon this production through the interaction of potassium chloride and burkeite, another practical application of the phase rule. In 1939 this company announced its willingness to expand initial production to provide the essential requirements of agriculture, and proceeded to do so. This was followed in short order by the completion of the refinery of the International Minerals and Chemical Corporation with the production of potassium sulfate from langbeinite (a natural potassium-magnesium sulfate) by interaction with potassium chloride. Thus, doubts about the adequacy of wartime supplies of this form of potash essential for quality tobacco, promptly subsided.

The interruption of European exports deprived the U.S. of its accustomed source of agricultural water-soluble "magnesia" and magnesium sulfate of potash-magnesia, both of German origin. This situation was adjusted by International Minerals

& Chemical Corp. in production of "washed langbeinite," an acceptable substitute for the formerly popular sulfate of potash-magnesia.

U.S. Production Continues

THROUGH the war years and since, there has been no let-up in the potash industry's efforts to meet requirements. Thus from an output of 535,000 tons of potash salts, equivalent to 317,000 tons K_2O in 1938, the last normal prewar year, production has increased each succeeding year, reaching a total of deliveries in 1947 of 1,936,000 tons of salts, equivalent to 1,045,000 tons K_2O .

Added to domestic demand was the task, voluntarily assumed by the producers, of supplying Canada with its requirements on terms of exact equality with those of the U.S. The requirements of Puerto Rico and Hawaii, were also added, as well as those of Cuba and South America.

On the basis of the production and price records, it would appear that the American potash industry is justified in cleaning its competence to meet the nation's essential needs for potash salts for the agricultural and chemical industries, during not only the critical period of World War II but also subsequent years.

For total supplies available, there should be added to the foregoing 5,000 tons K_2O imported into

North America in 1946 and 50,000 tons, in 1947. The item "other exports" relates to shipments to countries other than those mentioned in the title of the above tabulation.

With further reference to potash importations from Europe, it was expected that they would reappear with the progress of reconstruction in the European areas of production. Imports have reappeared in limited tonnages but at prices far above the domestic quotations. Since potash prices in the United States are the lowest of all world markets, it is apparent that only unsold surpluses abroad, which do not exist, or the quest of dollar credits would provide incentive for exports to this country in any great volume.

Distribution of the American output within the United States, during the fiscal year ended May 31, 1947, consisted of deliveries of potash salts to 43 states and the District of Columbia, which may be taken as the prevailing pattern. In that year, Georgia led with deliveries of some 75,000 tons K_2O , followed in order by Illinois, Ohio, Virginia, and Florida. State deliveries, however, cannot be taken as synonymous with state consumption, because potash salts are sold wholesale and in carlots to the fertilizer mixing industry which ships across state lines into neighboring and sometimes quite distant states where the potash finds its ultimate consumption in the fertilization of crops. In such situations, therefore, state consumption may

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Eastern Branch A.A.E.E. Tackles New Chemical Problems

DR. F. C. Nelson, formerly vice-chairman of the Eastern Branch of the American Association of Economic Entomologists, was elected chairman for 1949 at the group's 20th annual meeting at the New Yorker Hotel, New York, November 18 and 19. Dr. Nelson succeeds Dr. C. M. Packard, U.S.D.A., Washington, D.C. The new vice-chairman is Edwin Gould, Kearneysville, W. Va. Dr. B. F. Driggers, New Brunswick, N.J. will continue as secretary-treasurer.

Dr. S. A. Rohwer, assistant chief, Bureau of Entomology and Plant Quarantine, U.S.D.A., and president of the A.A.E.E., told the assembly that entomology has entered a new era in which entomologists must recognize their responsibilities and take them seriously. The control of insect pests is now merely a part of the over-all use of insecticides, he pointed out, and added that control is actually the lesser part. The end product . . . fruit, vegetables and other crops . . . must be produced with safety to the user. Safety, he said, must have first consideration. He pointed out that public health groups are greatly concerned with problems of toxic residues on edible crops, and also the effect of insecticides on a crop's flavor. The A.A.E.E. president stated that the use of new tools will mean much to the nation and to agriculture if these materials are correctly used. If they are not properly employed, he warned, public opinion may take away the advantages of new insecti-

cides. How much to use and where to use it is the keynote of the insecticide problem, Dr. Rohwer stated. He concluded by saying that sound planning demands knowledge of where the insects are, their species, when they occur, and what materials will control them.

The meeting's program called for the presentation of some 41 papers, covering wide phases of entomology. Due to the number of subjects discussed, and the closeness of the meeting to the closing date of this magazine, it was possible in this issue to mention but a few of the papers given. These included three papers dealing with control of Japanese and oriental beetles, "Chlordane for Control of Larvae of the Japanese Beetle by Walter E. Fleming of the U.S. Department of Agriculture, "The Oriental Beetle as a Turf Pest Associated with the Japanese Beetle in New York" by J. A. Adams of the N.Y. State Agr. Exp. Station and "Residual Activity of Insecticides in Control of Turf Insects" by John C. Schread of the Connecticut Agricultural Experiment Station. Mr. Fleming's paper indicated that chlordane applied at the rate of 10 pounds per acre was found to be particularly effective in controlling larvae of the Japanese beetle. In one series of tests it proved to be 70 times as effective as DDT and 7,000 times as effective as lead arsenate. Mr. Schread's paper indicated that chlordane, "Toxaphene," Parathion and DDT had all proved effective in controlling Japanese beetle

grubs, chlordane being by far the best and the other insecticides following in the order indicated.

Ernest Burch, of the Edgar Hurff Company in a paper "Control of Vegetable Insects and Diseases with the Mist Blower Sprayer" reported on results with this sprayer in controlling aphids on egg plant with rotenone and nicotine. It was also employed successfully in controlling late blight on tomatoes with coppers and Bourdeaux.

In another paper at the opening morning session Nancy Woodruff and Neely Turner of the Connecticut Agricultural Experiment Station reported that adjuvants have been found to increase toxicity of spray powders. Their addition to these powders does tend to decrease tenacity of adherence slightly, but the effect is insignificant at low concentrations. Advantage may be taken of this fact by using a low concentration of adjuvant.

Another paper by the same two authors "Formulations of DDT and Chlordane for Control of Potato Pests" reported that chlordane does not give as good control as DDT on potatoes, but a higher total yield resulted. Combinations of chlordane and DDT may be effective, these authors indicated. Less injury was experienced with dusts than with emulsions.

"Early Season Control of Oriental Fruit Moth Using DDT" was reported by Donald W. Hamilton, U.S.D.A., Poughkeepsie, N. Y. Instead of treating with DDT for

second and third brood, field tests were made this year with applications timed for first brood moths and second brood larvae. These applications coincided with BHC applications timed for plum curculio. The newer method was found to be more satisfactory than the former schedule. A considerable amount of labor was saved and the danger of late-season spray residues was avoided.

A paper by B. F. Driggers and Leland G. Merrill, Jr., New Brunswick, N. J., reported on "Oriental Fruit Moth Control on Peaches with DDT and Parathion." Field tests on peaches show parathion to be somewhat more effective than DDT in the control of second and third brood Oriental fruit moth, the paper said.

A discussion of the red banded leaf roller problem in New York State was presented by E. H. Glass and P. J. Chapman, Geneva. They reported that this insect has grown into the status of a serious pest on apples in New York state. Experiments in control measures during 1948 have indicated that first brood can be controlled by applications of DDT or parathion, while DDT plus lead arsenate or parathion are effective against second brood. It is considered that the use of DDT for control of codling moth is responsible for the outbreak of this pest, because it comes too late to catch first brood Red Banded Leaf Roller.

"Further Studies on Resistance to DDT in the Housefly" was the title of a paper presented by George W. Barber and John B. Schmitt, New Brunswick, N. J. They reported that the tenth and eleventh generations of the Ellenville line of flies were used for the tests. This line was not further exposed to the present generations during rearing. Standard tests were employed (as described in Bulletin 742, August, 1948, N. J. Agr. Exp. Station, New Brunswick) using DDT (tech) p,p'DDT, methoxychlor, and other compounds. Conclusions indicated that there is still considerable resistance to DDT and related compounds, although less than that displayed by third generation flies. The insects were knocked down, but

A.A.E.E. President



S. A. ROHWER
Speaks at Eastern Meeting

recovered after several hours. Less resistance was shown to methoxychlor

than to other compounds of the DDT type. The standard laboratory strain of flies showed no resistance to any of the compounds.

At a brief business session following the closing of the morning program on November 18 reports were presented by the Entoma Committee and the Award Committee. The Entoma Committee advised that the Eastern branch publish the 8th edition of Entoma and that after issuance of this 8th edition publication of this annual directory be turned over to the national organization, the American Association of Economic Entomologists. The Award Committee recommended that if the awards for papers presented at the annual meeting are to be continued, that changes be made in the basis for selecting the winning papers.

AAEE Holds Annual Meeting Dec. 13-15

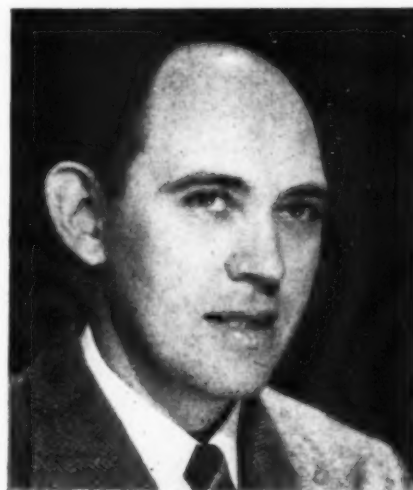
WITH a program featuring discussions on toxicity, formulation and new insecticides, plus announcements by manufacturers of new insecticidal products, the American Association of Economic Entomologists was to meet at the New Yorker Hotel, New York, on December 13, 14 and 15. Part of the meeting was to be held jointly with the Entomological Society of America.

The advance program, released at press time by Dr. Charles E. Palm, Cornell University, chairman of the program committee, indicated that one hundred technical papers would be presented, in addition to a session in which manufacturers were to announce new insecticides for either experimental or commercial use in 1949. Both the industry and official agencies were invited to take part in making brief statements on industrial chemicals or formulations which have not yet been introduced to entomologists generally. Manufacturing companies were also invited to announce new proprietary insecticides to be marketed for the first time, or which had been introduced since the meeting of the session at last year's event.

On Wednesday evening, the annual A.A.E.E. banquet was to be

held, and the meeting was to terminate on Thursday afternoon at the end of a final paper-reading session. All sessions were to be at the New Yorker Hotel.

A.A.E.E. Program Chairman



DR. CHARLES E. PALM

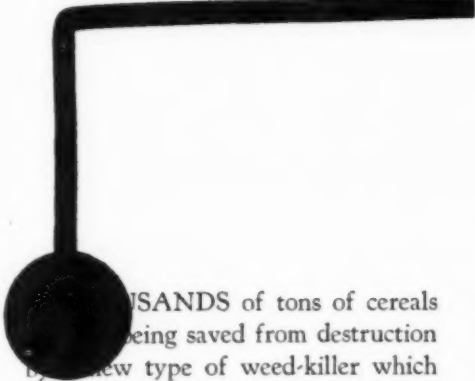
Officers of the A.A.E.E. for 1948 are: Dr. S. A. Rohwer, Assistant Chief, Bureau of Entomology and Plant Quarantine, U.S.D.A., president; Dr. Al Boyce, University of California, vice-president; Dr. Ernest N. Cory, College Park, Md., secretary-treasurer; and Dr. H. S. McConnell, College Park, Md., interim secretary for 1948.

British Develop "Agroxone," New

WEED KILLER

by

Paul West

THOUSANDS of tons of cereals are being saved from destruction by a new type of weed-killer which has been developed in Britain during the last few years. Known as "Agroxone," the new product is a synthetic hormone which has the property of killing weeds by overstimulating their growth.

Hormones have long been known as the organic chemical substances which control growth in both plants and animals; research has proved that just as an excess of hormones may have a fatal effect on the human body, too strong a concentration of hormones can kill plants. Experiments have proved that various hormone substances of the same type applied in the same concentration have different effects on different plants. In other words, the effects are selective—many plants have a strong reaction, others a weaker reaction, and some no reaction at all.

Interesting biological studies of plant life were developed from this new knowledge: one of the most successful experiments dealt with cuttings stimulated by hormones to induce root-growth. In 1936, experiments were begun at the Imperial Chemical Industries Jealott's Hill research station, on the effects of hormone substances on plant growth in general, and the I.C.I. succeeded in producing synthetic hormone compounds on the basis of the known properties of the natural substances.

It was observed at Jealott's Hill that a minute quantity of hormone, such as 10 parts in one million of alpha-naphthylacetic acid, assisted plants, whereas a stronger concen-

tration of 100 or 1,000 parts per million was very injurious because growth was over-stimulated. There was a period of rapid and abnormal growth and soon afterwards the plants died. Research was undertaken with a large variety of plant-types and various hormone concentrations.

EDITOR'S NOTE: L. W. Kephart, U.S.D.A., weed expert and member of the Editorial Advisory Board of Agricultural Chemicals, has made the following comment on the British product described in this article: "Agroxone" and its base chemical 'Methoxone,' 2 methyl, 4 chloro-phenoxyacetic acid, have been tested in the United States with fair thoroughness but have not been found equal to 2,4-D in experiments thus far. On a pound-for-pound basis, 2,4-D has given better results than MCPA, while in addition, it appears that the latter would be somewhat more expensive. Experiments are continuing with these products and it may be that specialized uses may be found for them."

In 1940, oats were sown together with charlock, a common weed, as an experiment; they were given a fairly strong dose of hormones with the result that the charlock died and the oats were unharmed. From that time, research was directed towards the adaptation of hormones as selective weed-killers. In the experiments, hormone compounds of special activity were selected and after detailed study it was found that the compound known as methoxone or 2-methyl-4-chloro-phenoxy-acetic acid (or MCPA for short) was the most satisfactory. It is this substance which forms the chemical basis for "Agroxone."

Older types of selective weed-killers, such as dilute sulphuric acid, depend for their action chiefly on

the external structural differences between crops and weeds: MCPA works on the principle of absorption into the plant tissues. Weeds which are affected become twisted and deformed, and finally die. When the weather is warm, this can happen in a few days, but it may take several weeks if it is cooler.

MCPA can be absorbed by roots or leaves and the selective effect is the same whether it is applied before or after the germination of the crops and weeds. It has a further advantage over the older types of weed-killers, in that it is non-poisonous and easily handled, and does not corrode the sprayer or dusting machine. Used dry or in solution, its effect is less dependent on the weather than that of many older types.

In 1943 small-scale field tests were made on the activity of MCPA on a huge variety of weeds, and in 1945 extensive research was carried out at more than 100 field-stations in all parts of Britain, under the most varied geological and climatic conditions, to provide a complete check on its effects on various weeds and cereals. It was found possible through the use of "Agroxone" to check the growth of pennycress, charlock, and buttercups completely, and valuable results were also obtained in the case of such weeds as corn marigolds, chickweed, poppies, thistles, and bindweed.

These researches were originally directed against weeds in corn-fields and only later were they extended to grass-lands. It has already been observed, however, that hormone compounds are suitable for attacking field buttercups, dandelions daisies and other parasitic plants which do so much harm to lawns and sports-grounds.



Dr. Russell Coleman
Makes Presidential Debut

PROSPECTS for a continuing domestic demand for the output of American fertilizer plants on one hand, and on the other, Government threats of increased shipments of fertilizer materials abroad were voiced by Ray King, Georgia Fertilizer Co., Valdosta, Ga., Chairman of the Board of the National Fertilizer Association, in his keynote address before the NFA fall meeting, at the Biltmore Hotel, Atlanta. The three-day meeting ran from November 15 to 17. Mr. King expressed concern over the likelihood of a continuance of Government policies which have obtained during the past 16 years. Possibilities of the return of production control, allocation of scarce materials, price controls, reimposition of excess profits taxes and repeal of the Taft-Hartley Act

N.F.A. Foresees Continuing World Demand, Prosperity in **FERTILIZER**

give occasion for serious reflection in the industry, he said. "Of peculiar importance to the fertilizer industry is the possibility of legislation to put the Government further into the business of producing and distributing fertilizer in competition with private enterprise," he declared. He continued by urging each manufacturer to inform Senators and Congressmen of the situation, so that they may deal with vital matters in a long-view, constructive manner.

Returning to the domestic market situation, Mr. King pointed out that the extraordinary demand for farm products, and hence for increased quantities of fertilizer materials, is likely to continue for some time yet. The fact that the U.S. Congress has again gone on record to continue the program of price support for farm products as a per-

manent part of the agricultural economy, is another factor favoring heavy demand for fertilizer materials in the United States, he said.

In a plea to the fertilizer industry to continue its efforts to maintain high production, Clement D. Johnston, president of the Roanoke Public Warehouse, Roanoke, Va., pointed out that the security of the United States depends greatly upon increased production not only of agricultural chemicals and mechanical implements, but also of other commodities. He said that the rest of the world needs an example more than anything else. Europe is more in need of incentives for increased production than it is anything else, he declared, and continued by saying that trade associations representing some four million private enterprises in the U.S., could do more for the

C. T. Prindeville
Presides at Annual Banquet



Dr. Firman E. Bear
Defends Commercial Fertilizers



Clement D. Johnston
Calls for Increased Production



rehabilitation of Europe than can Government hand-outs.

F. H. Leavitt, technologist of the Shell Chemical Corporation's Agricultural Department, San Francisco, Calif., presented a series of colored slides showing progress in "Nitrogation, Nitrojection and Soil Fumigation—Their Application and Results." He explained how improved techniques in the application of both fertilizer and soil fumigants have helped to control serious soil pests, including the root-knot nematode in a number of crops. Methods of fertilizer application were pictured, with comments on results.

In his first appearance before the group, the newly-elected NFA president, Dr. Russell Coleman, discussed the over-all fertilizer situation, reviewed the progress made by the industry over the past several years, and pointed out the significance of increased fertilizer consumption in western areas. "In a quarter of a century, fertilizer consumption has increased 25-fold in Wisconsin, 23-fold in Minnesota and 66-fold in Iowa," he said, and continued by reminding that "in the western states, fertilizer consumption has increased from 87,000 tons in 1923 to almost a million tons in 1947; an increase of more than 10 times." Although part of this increase is undoubtedly due to high farm prices, the larger increase for these western and midwestern regions represents a realization of the need for fertilizer

for soils previously well supplied with plant food. Removal of nutrients from the soil in these areas has been stepped up by higher-producing, better quality crops, he said, using as an example the tremendous plantings of hybrid corn which have contributed to the need for replenishing plant foods in the soil.

The new president discussed the latest farm techniques being introduced in the South where increased corn production offers tremendous additional potential fertilizer sales. He presented a number of colored slides in which were shown the improvements in pasture lands, corn and small grains through generous application of fertilizer materials, and in this connection stated that if a recession occurs in farm prices, growers may find it economical to cultivate smaller acreages for bigger crops through intensive fertilization practices.

Dr. Firman E. Bear, Professor of Agricultural Chemistry and Chairman of the Soils Department of Rutgers University, New Brunswick, N.J., defended the use of commercial fertilizers to contradict critics who maintain that continued use of such materials will rob the soil of certain qualities and will eventually make it unproductive. He cited the 95-year-old experiment at Rothamsted, England during which time continual applications of commercial N-P-K have been used year after year, and noted that a plot which had received



F. H. Leavitt

Reports Results of Experiments

1,392 pounds of fertilizer annually, had out-yielded a similar plot receiving an annual dose of 15.7 tons of manure. This, he said, was true not only for the first 10 years and the first 40 years, but for the entire 95 year average. During the past 5 years, the fertilizer plot averaged 4.4 bushels of grain more than the heavily manured plot.

Dr. Bear pled for increased attention to soil conservation, stating that the fast pace of modern farming lends itself to greater erosion of soil. He pointed out that the fertilizer industry has a responsibility for correcting soil deterioration, partly because the industry has made possible this condition. "Without fertilizers, we would long since have been compelled to adopt better systems of soil management. Otherwise we

Gordon R. Clapp
Discusses TVA Activities



Ray King
Predicts Increasing Demand



Ray M. Suter
Describes Labor Problems





Officers and directors of National Fertilizer Association photographed at Atlanta convention.

would have gone hungry during World Wars I and II," he declared. He continued by saying that the fertilizer industry must begin to think seriously about using every means to bring about soil conservation, regardless of whether or not the program includes the use of fertilizer materials. Dr. Bear asserted that although fertilizers, when properly employed, will make poor land productive, it would be more in keeping with their potentialities if they were used to make good land better.

A discussion of the aims and policies of the Tennessee Valley Authority was presented by Gordon R. Clapp, Chairman of the Board of TVA. He told the NFA group that the fertilizer industry and TVA have much to gain in mutual understanding. He defended the educational program being undertaken by TVA in its test-demonstration activities, stating that it is "raising the level of the whole farm system through the use of fertilizer and thus increases the value of fertilizer to the farmer." The other major service being rendered by TVA, said Mr. Clapp, is research in new processes and products, which increases the concentration of products and points the way to lower costs to industry and to the farmer.

The TVA Board Chairman discussed four activities which, he said, "contain the basis for constructive cooperation between the NFA and TVA." The first point is that the TVA program has increased the fertilizer market, because the 12,000 test-demonstration farmers in the

Valley counties and their neighbors buy greatly increased amounts of fertilizer. "The more intensive the test-demonstration activity and the longer it is maintained, the more the use of the TVA materials stimulates sales of commercial fertilizer," he said.

A diversified agriculture will improve the stability of fertilizer markets, he brought out. He quoted extensive figures to show how the influence of TVA has been beneficial. One million acres have been shifted from open cultivated crops to grass and cover crops, he said. Land in row crops in the Tennessee Valley decreased 19 per cent while in the U.S. as a whole, such acreages increased 2 percent, he stated.

TVA's research and experiment in new processes of production and new fertilizer products point the way to greater supply for greater markets, Mr. Clapp continued. He recalled how the improved nitrate plants built at Muscle Shoals 30 years ago are carrying on research in the development of new processes and new fertilizer products.

The final talk on the program was presented by Dr. C. C. Murray, Director of the Georgia Agricultural Experiment Station, Experiment, Ga. He told the NFA members that fertilizer and lime in liberal quantities constitute the major factors making for a new successful and profitable live-stock enterprise in the Southeast. The main requirements, he

said, in addition to lime, are nitrogen, phosphate and potash. He reported that fertilizer application results in more productive pasture lands. An important by-product of fertilizer application, he said, is the disappearance of certain weeds which are replaced with white clover, bluegrass and other desirable species of plants.

He reported that the ideal of "June grazing in January" is now a reality in the South. As a three-year average, the net return from a well-fertilized winter pasture was \$97 as contrasted with \$38 from similar areas receiving no fertilizer. Milk from cows pastured during the winter contained 232 percent more carotene and 81 percent more vitamin A than did milk from barn-fed cows.

The annual NFA banquet was held Tuesday evening, with vice-chairman of the NFA Board, C. T. Prindeville, Swift & Co., Chicago, presiding. An hour's entertainment, including music, ballet dancing, and acrobatics featured the program.

On Monday evening, Ashcraft-Wilkinson Co., Atlanta, invited the entire group to a barbecue at the Druid Hills Golf Club. The barbecue was followed by a group of musical entertainers and a number of audience-participation stunts with Emory Cocke, Ashcraft-Wilkinson Co., as master of ceremonies. Transportation by bus was provided by A-W Co.

The twenty-second annual Southern NFA Convention drew a near record registration of more than 400 for the three-day session.

Experiment Station Digest

By H. H. Slawson

ALABAMA Agricultural Experiment Station, Auburn, Ala., has been conducting an investigation of the toxicity of DDT to steers and hogs, which were fed 1 part of the insecticide to 10,000, 20,000 and 50,000 parts of corn during a period of 100 to 120 days. In a second test, two lots of hay containing 48 and 184 P.P.M. of DDT were fed to fattening steers and to dairy cows.

After slaughtering, tests for DDT were made on hearts, livers, spleen and kidneys and from the fat and lean tissues. Milk samples from the dairy cows were also tested for DDT content at regular intervals. Results reported were as follows.

1. The animals showed no visible signs of toxicity.
1. Weight gains of both hogs and cattle tended to decline as the DDT content of the ration increased.
3. Relatively large amounts of DDT were found to be stored in internal organs of the slaughtered animals and smaller amounts in the lean tissues.
4. Analysis of milk samples from the dairy cows indicated that DDT was being passed in the milk.
5. Milk from cows receiving hay treated with DDT was lethal when consumed by flies.
6. DDT was present in the fatty and internal organs of slaughtered calves that suckled cows fed DDT-treated hay.

The storing level of DDT in tissues and organs was also determined by analysis. Detailed figures on findings are tabulated in the report, which summarizes as follows:

"The DDT content of tissues from beef cattle was proportional to the amount of DDT in the feed. . . . The DDT content of tissues from beef cattle was appreciably higher than that of corresponding tissues

from hogs. The rate of disappearance of stored DDT was very slow, from beef cattle after the feeding of DDT was discontinued. There were still appreciable amounts of DDT in the carcasses after the animals had been in pasture for as long as 210 days."

Another Alabama study covered the response of machine-shelled seed of Spanish and runner peanuts to a number of different seed disinfectants. All materials tested gave significant increases in stands, best results coming from use of "Du Bay 1452-F," "2 percent Ceresan," "Ara-san," "Phygon," "Dow 9" and "Spergon," the report states. Emergence from untreated seed was 50 to 60 percent, while that from the treated seed was generally above 80 percent. Peanut seed shelled and treated 9 weeks ahead of planting, produced stands as good as those shelled and treated one day ahead of planting.

In testing chemical compounds for control of nutgrass, it was found that "Uramon" destroyed this pest in Norfolk in sandy soil.

Two pounds of "Uramon" per sq. yd. killed 97 percent of the tubers and 3 pounds destroyed all tubers when mixed thoroughly throughout the soil to the depth of penetration of the tubers.

Experiments were conducted at the Auburn station to determine the effectiveness of powdered insecticides against rice weevils and other insects in shelled corn stored in quart fruit jars fitted with 30-mesh screen wire covers. DDT was reported highly effective over a 3-month period. At 10 p.p.m., DDT gave excellent control and was slightly more effective than "Rhothane" at 40 p.p.m. A Ryania ("Ryanex")-DDT mixture was no more effective than DDT alone. Effectiveness of DDT was reduced greatly by hydrated lime and by magnesia dust and to a lesser extent by pulverized iron ore and ferric oxide in the order named. A

"Dilroc"-DDT mixture was as effective over a 3-month period as DDT alone.

Results with different samples of benzene hexachloride were not as consistent as with DDT. Based on total $C_6H_6Cl_6$ content, BHC appeared slightly less effective than DDT, particularly at the lower dosages. Based on the gamma isomer it was much more effective than DDT. . . BHC as a residual coating on bottom and sides of the jar was 100 percent effective against weevils infesting the corn stored in the jar. A similar DDT residue resulted in 86 percent mortality. As a fumigant, BHC was moderately effective at the end of one month.

Kentucky Reports

KENTUCKY experiment station, at Lexington, Ky., reports on tests of cotton bags impregnated with DDT to protect stored corn from insect damage. Eight large and small bags were dipped in or sprayed with solutions of 2½, 5 and 10 percent DDT dissolved in carbon tetrachloride. Another eight untreated bags were used for comparison. Six months after treatments, the percentages of damaged grain were 8 percent in bags treated with the 2½ percent solution; 2.0 percent in bags treated with 5-percent solution; and 1.5 percent in bags treated with the 10-percent solution. Thirteen months after treatment, similar comparative results showed that practically all grain in untreated bags was damaged at the end of six months.

Tests were made at the Kentucky station for control of green beetles by applying benzene hexachloride and chlordane on the surface of soil in cages containing the grubs. After detailing procedure, the report adds that control was not satisfactory in any treatment.

Other tests were made of new soil insecticides against white grubs in bluegrass sod. Counts made seven weeks later and compared with untreated plots indicated, says the report, that chlordane emulsion at 5 lbs. actual chlordane per acre, gave an average mortality of 80.3 percent;

benzene hexachloride emulsion at 2 lbs. gamma isomer per acre gave average mortality of 78.9 percent; and a one-half saturated solution of "DD" (1, 3 dichloropropene—1,2 dichloropropane) at 1 qt. per sq. ft. gave a mortality of 26.9 percent. Bluegrass was uninjured.

Spray tests were made to compare the effectiveness of four compounds against May beetles feeding on pine oak foliage. In every test, chlordane at 1 lb. actual material in 100 gals. of mixture gave excellent control of both male and females. However, chlordane showed little if any repellence, much of the foliage being consumed. DDT and lead arsenate were very repellent. Benzene hexachloride at 1/4 lb. of the gamma isomer in 100 gals. of mixture was moderately repellent but gave good control in only one of three tests.

In Kentucky station corn plots, applications of 2,4-D as a spray or dust to the soil 2 or 3 days before the corn came up, inhibited growth of weeds and grasses for six or seven weeks, without injuring the stand or growth of the corn. Applications of 2,4-D after emergence of the corn also controlled weeds effectively, under varying conditions detailed in the report.

Wild garlic was prevented from producing aerial bulbs in bluegrass pasture and in a rye field, and stands of garlic plants were reduced with heavy applications of 2,4-D. In all plots reduction was as much as two-thirds; and in some plots sprayed with heavy applications of ester, the stand was reduced only a few plants. Bluegrass was apparently uninjured and only a few rye plants were distorted. Wild onions were killed with 2,4-D much easier than wild garlic.

During the year 1,260 official samples of fertilizer, taken by inspectors, were analyzed at the Kentucky station. Two cases were filed for prosecution because of failure of products to equal guaranty, resulting in fines and court costs. Two shipments of fertilizers were found seriously underweight but purchasers were fully reimbursed by the company involved, the report states.

Ohio Experiments

OHIO station at Wooster conducted experiments on the influence of various organic pesticides on the growth and transpiration of the host plants. Many of them stunted growth greatly, the report states, and by their unfavorable effect on foliage, they reduced transpiration to a progressively larger degree with the passage of time.

DDT was found to check both growth and transpiration on tomatoes and to slow down transpiration on potatoes. Hexachlorocyclohexane had a similar effect. "Methoxy" and "Rhothane" had little effect on growth or water loss of potatoes but did decrease transpiration of tomatoes slightly.

"Dithane" in liquid form to which zinc sulfite and hydrated lime were added at time of preparation for spraying, increased transpiration of potatoes and tomatoes nearly as much as did Bordeaux. "Zerlate," "Fermate" and several other organic fungicides had comparatively little effect on transpiration.

Ohio spray tests indicated that flotation sulfur paste is still the best fungicide for apple scab control, the investigators report. Some other newer fungicides tested gave excellent control of scab but caused injury to either fruit or foliage while others failed to give satisfactory control. "Fermate" gave good results but did not surpass flotation sulfur. It is more costly, the report states.

"Fermate," however, was approved for control of black rot of grapes, its performance measuring up to that of Bordeaux mixture without any injury, such as often accompanies use of this copper spray, the report says. "Fermate" controlled not only black rot, but also scab, blotch and rust. "Results of the bitter rot tests, indicate," says the report, "that the disease can be controlled without the use of copper."

DDT and other new organic pesticides were compared with calcium arsenate and Bordeaux for control of potato insects and diseases. To secure maximum results the Ohio station recommends 1 lb. actual DDT per acre in approximately 200 gals.

of spray, applied at 10 day intervals.

Zinc ethylene bis dithiocarbamate was rated as the outstanding fungicide on vegetables in Ohio. "Bioquin 1" also ranked "at or near the top" in a list of ten new materials tested.

At the Nebraska station at Lincoln, tests for control of mange in hogs indicated that hexachlorocyclohexane ("666") was the most effective. In all herds sprayed with 0.25 or 0.50 percent concentration, the mange was completely cleared up with no evidence of reinfestation three months later. Other materials, including DDT and a patented rotenone extract emulsion gave no control.

Growth of sprouts on stored potatoes at the Nebraska station was delayed a number of weeks and then greatly retarded by dusting or spraying tubers with the methyl ester of alpha-naphthaleneacetic acid. Potatoes kept at 50° storage temperature have better cooking qualities and retain more ascorbic acid than those stored at 40° or less, the report points out.

Using hexachlorocyclohexane against grasshoppers, the Nebraska experimenters obtained kills ranging from 70 to approximately 100 percent. Preliminary tests of a dust containing 2 percent "1068" also showed promising results. At Nebraska's North Platte substation, cows and calves were sprayed with DDT for fly protection before being turned out to pasture. Compared with untreated animals, the sprayed cows gained an average of 17 lbs. more while calves in the treated lots gained 14 lbs. more per head than those in the unsprayed group.

Purdue University agricultural authorities made studies to determine the response of 97 plant species to 2,4-D sprays. Of these, 48 are termed "susceptible," 23 "intermediate" and 26 "resistant."

Only slight reduction in corn yield resulted when 2,4-D sprays were used to control weeds in corn, but the testers decided that further work is necessary to determine the optimum time to apply sprays, before recom-

(Turn to Page 71)



by

Melvin Goldberg

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37 Wall Street.
New York 5, N. Y.

RAW materials now appear to be available in quantities sufficient to assure an increase of 2,4-D materials during the 1948-1949 season. Unfortunately, exact figures for the 1947-1948 production are not available but most industry spokesmen estimate that about 16 million pounds of 2,4-D in terms of the acid were produced for the 1948 agricultural year.

The United States Tariff Commission has recently issued statistics on the production of 2,4-D materials for the calendar year 1947. These figures are as follows:

2,4-D acid	5,629,000 lbs.
Sodium salt	1,750,000 lbs.
Other derivatives including esters of 2,4-D	1,487,000 lbs.

It was not possible to trace the concentrations of 2,4-D content to which reference is made in the above figures. Hence, it is not possible to compare these figures accurately with estimates of what will be produced in the calendar year 1948 and calendar year 1949.

While the tendency during the past season was in favor of the ester type of materials, it now appears

that most state authorities recommending the salts because of the fear of draft and resultant damage that has occurred where the esters were used. It does appear, however, that the butyl and isopropyl esters will continue to retain their popularity while the amine and triethanolamine salts as well as the sodium salt will continue in fair demand.

The 2,4-D acid during the latter part of this past season sold generally for 70c per lb. in carload lots but toward the end of the season the price of the acid finally settled at the 75c per lb. level. It is believed that this will be the price at least for the early part of the current season, but should there be further increases in raw materials as well as freight, a price rise may be in the offing. The isopropyl ester last season sold for about 95c per lb. while the butyl ester was in the vicinity of 90c per lb. and it is expected that the same price setup will be in order in the early part of the season. It should be pointed out that the ester must be formulated further with emulsifying agents and similar materials before it is ready for ultimate use by the consumer.

Continuing interest is being shown in the 2,4,5-trichloro phenoxy acetic acid compound for use as a general all-around weed killer. It is known that there is considerable interest being shown in this compound and various field experiments were conducted during this past season in the evaluation of this compound.

Benzene Hexachloride

BASED on recent figures released by the Tariff Commission, the production of benzene hexachloride during the 1947 calendar year was 8,197,000 lbs. Unfortunately, it is difficult to determine accurately the basis upon which these figures were given, but the average seems to be 12% gamma content.

Due to the off-season nature of this chemical at this time, there is very little material actually being moved by the primary manufacturers. Most industry spokesmen feel that benzene hexachloride in combination with DDT and sulphur is generally accepted as a good controlling agent for the various insects attacking cotton. It is expected that there will

be increasing movements of benzene hexachloride during January and February as the manufacturing season for the cotton dusts begins to get under way.

Rotenone

THERE has been a marked decline in the market price of this material and it is now accepted in industry circles that the price for the material in large quantities is in the general vicinity of 95¢ to \$1.00 per lb. What effect this price reduction will have on its increased use in agricultural insecticides cannot be evaluated at the present time, but it is felt that its use may increase in the control of insects attacking cotton.

It is showing greater use in the field of household insect pests than is realized by many in the industry. There are several national distributors of household insecticides that are using chlordane as one of the active ingredients in their general household insect sprays.

Chlorinated Camphene

AMPLÉ supply of "Toxaphene" is indicated for 1949, according to information from its makers, Hercules Powder Co., Wilmington, Del. The current price quotation is 24¢ per pound, F.O.B. Brunswick, Ga., and this figure will remain firm until August 1, 1949, the company says. "Toxaphene" distributed in 1948 was sufficient to produce thirty million pounds of twenty percent dust. Additional manufacturing facilities will be available for 1949, a company spokesman stated.

Chlordane

IT is becoming more evident that rotenone will be in short supply for the coming agricultural insecticide year. Aside from the supply of ground root which is here actually in the United States at the present time, most trade sources believe that there will not be any great amount of additional supplies brought into the country in sufficient time to have the new stocks put into domestic distributing channels.

Due to the unsettled domestic price situation of the last four to six

months, the harvesting of the crude rotenone material in South America has been adversely affected so that there is now no assurance as to what price it takes to get the material moving. Import circles are unable to assure any time delivery. It generally requires three to four months from the time that material is harvested and prepared for shipment in the South American markets for it to be shipped, processed and distributed into domestic channels.

Industry spokesmen believe that there is a definite swing back to the use of rotenone in many fields of use. Increasing popularity for the use of rotenone in the control of pea aphids and cattle grub should mean an increased use of rotenone in these fields. This latter use is particularly important in view of the fact that Federal financing is now available for the cattle grub program.

Present prices are still at the 31¢ per lb. level for 5% material, but there is material moving at 29¢ and even 28¢ per lb.

Pyrethrum

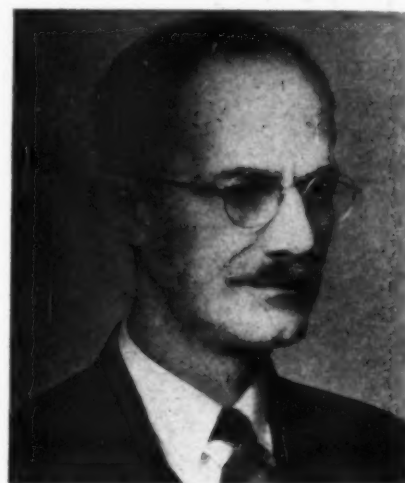
IT continues to appear that there will be a definite tight supply of pyrethrum for this 1948-1949 season. This is reflected, as was pointed out in last month's article, in an increase in the price of pyrethrum concentrate. Most companies have already increased their price of 20-1 concentrate about 25¢ per gallon and it is expected that the price of the 20% material used in the low pressure aerosol bombs will go up about 50¢ to 75¢ per lb.

Several industry spokesmen pointed out that the use of synergists will be greatly expanded during this year of pyrethrum shortage.★★

N. Central Weed Conf.

A full three-day meeting of the North Central Weed Control Conference was scheduled to begin on Wednesday, December 8, at the Abraham Lincoln Hotel, Springfield, Illinois. The advance program called for registration to begin at 8 a.m. Wednesday, followed by the remainder of the morning session under the chairmanship of Dr.

C. J. Willard, Ohio State University, Columbus, president of the Conference. L. M. Stahler was to report



DR. C. J. WILLARD

on the coordinated research of 1948; R. F. Fuleman, on pre-emergence treatments on corn; and K. P. Buchholz on pre-emergence treatments on other crops.

The afternoon was to be devoted to sectional meetings. Chairmen of the three sections were to be H. E. Wood, field crops; B. H. Grigsby, horticultural crops; and L. W. Melander, non-tillable land. The late afternoon was to be devoted to conferences and exhibits of herbicidal chemicals and application equipment. The evening was to be a continuation of the sectional meetings, with E. A. Helgeson as chairman of a discussion on sugar beets, peas, potatoes and other specialized crops.

The program of Thursday was to be under the chairmanship of T. Y. Yost. A. H. Larson and George Knowles were to discuss perennial and annual weeds; W. L. Klatt and E. P. Sylwester were to talk on educational and action programs before the lunch period, and in the afternoon, W. W. Worzella, vice-president of the Conference, was to be chairman. Discussions of machinery and methods of application were to be held, as was a talk on the industrial viewpoint of the new herbicides. The annual banquet was scheduled for Thursday evening.

Friday's morning session was to be divided into three sections: Physiology and basic studies, George

(Turn to Page 69)

Comments....

By Dr. Alvin J. Cox

This column by Dr. Cox appears as a regular feature of AGRICULTURAL CHEMICALS. Dr. Cox formerly was successively Physical Chemist, Chief Chemist, Assistant Director, and Director of the Bureau of Science, Government of the Philippines. He was appointed Chief, Bureau of Chemistry, California State Dept. Agriculture in 1932, retiring in 1945.



TWO outstanding agricultural chemical meetings were held in California during the month of October. First was the 25th annual conference of the California Fertilizer Association and a few days later, the 19th annual Fall meeting of the Pacific Insecticide Institute.* Some of the highlights of the two meetings were as follows:

The silver anniversary of the California Fertilizer Association was held on October 18 and 19, 1948, in an atmosphere typical of California's Spanish background, in the Mission Inn, Riverside. The entire western fertilizer industry, together with representatives from the University of California at Berkeley, Davis and Riverside, were assembled. The occasion marked the Association's silver anniversary, with an appropriate program worked out by T. Walter Houser, Chairman of the Convention Program Committee and his committee composed of S. B. Tatem and Dr. Oliver E. Overseth. About 275 persons were in attendance.

President Dr. Wallace MacFarlane called the meeting to order

and Dr. W. E. Martin, Extension Specialist in Soils, Berkeley, presented the results of 1947 fertilizer tests to show how much nitrogen and how much phosphorus are desirable on California crops; oats, wheat, and barley. There is a certain degree of phosphorus deficiency in some soils, he pointed out, and in these there was only about a 30% response to nitrogen, for with low phosphorus the nitrogen cannot be utilized. Phosphorus aids early vegetative response and early maturity. With forty pounds nitrogen and forty pounds phosphorus per acre on sixty-five plots harvested, all but ten showed discernible effect.

Dr. E. F. Wallihan, University of California Citrus Experiment Station, Riverside, discussed "Radioactive Phosphorus as a Tool in Plant Nutrition Research." He said that phosphorus was chosen because of its importance in fertilizer and because one can trace an atom wherever it goes; leaves, stems and roots. A special advantage is that this type of radiation does not occur naturally.

Below: Photo of California Fertilizer Association Group at Riverside.

He mentioned use of radioactive atoms in smelting to determine in which part of a process a contaminant enters. He discussed the adequate precautions to be taken against hazard and the progressive disintegration of the material. A plant will take more nitrogen than needed, but there is a "ceiling" for phosphorus. The rate of entry is determined by the supply and the amount already in the plant.

Dr. Oscar A. Lorenz, Professor of Truck Crops, University of California, Davis, made a preliminary report on fertilizer placement. He stated that placement is a complex problem, depending on such factors as kind of crop, type of soil, moisture, and time of year. Fertilizer should be placed deeply enough to reach moisture and as close as possible to seeds without burning. There is good evidence that lack of response to proper placement is often due to ill timing.

Placement under plant row or edge of bed is better than in the center of the row. Shallow root crops give greatest response, and winter and early spring fertilizer cause response although later applications do

(Turn to Page 77)

*Full P.I.I. Report on page 62.





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The Listening Post

Plant Tests Affected by Soil Parasites

This department, which reviews current plant disease and insect control problems, is a regular monthly feature of AGRICULTURAL CHEMICALS. The comments on current plant disease problems are based on observations submitted by collaborators of the Plant Disease Survey, Bureau of Plant Industry, Soils, and Agricultural Engineering, U. S. Department of Agriculture, Beltsville, Md.

By Paul R. Miller



CAREFUL consideration of plant pathogenic nematodes should be exercised by investigators studying the behavior of test plants, warns Gerald Thorne of the U.S. Department of Agriculture. He cites numerous illustrations showing the need of such consideration when planning and executing experimental work which involves soils exposed to nematode infestation. Investigators not familiar with the plant nematode problem are often unaware or forgetful of this fact, it is pointed out, and root-attacking pests in particular may influence seriously the behavior of plants being tested. Such interference may falsify results of long range crop rotation and fertilizer experiments on infested fields, often to such a degree that the value of such tests from the standpoint of the original objectives, is highly questionable.

To illustrate the magnitude and variety of the problems encountered, Mr. Thorne mentions a number of instances observed by him at various Agricultural Experiment Stations. In one case, alfalfa stands failed to become well established, the root systems were branched and spreading, and few long tap roots were developed. In plots plowed up after four or five years, less than one-tenth of the roots were long enough to be cut off by the plow. After many years of work it was discovered that the root-knot nematode, *Heterodera marioni*, was largely responsible for the poor growth. Young seedlings were attacked early and tap root development was practically stopped.

As the tap roots were destroyed, laterals were produced; these in turn were attacked and still further stunting and multiplication of roots followed. Yields sometimes amounted to only two tons per acre where six tons should have been obtained.

In a series of crop rotation plots that had been established for more than 30 years, many of the crops did poorly because of root-knot nematodes on some areas, the presence of the pest being unsuspected until portions of certain plots were fumigated, with the result that more vigorous and healthy growth was obtained on the fumigated parts.

An elaborate series of experiments had been planned on fertilizers, irrigation, and spacing as related to the production of sugar beets, and the test fields had been selected tentatively. It was suggested that, before planting, the land should be checked for infestation by the sugar beet nematode, *Heterodera schachii*, and a nematologist demonstrated the presence of the pest in all fields under consideration . . . and to a particularly serious degree in the most favored field.

Mr. Thorne states that it is very doubtful if a plot or field can be selected that is not inhabited by one or more species of root-attacking nematode. The usual "stimulation" that results from soil fumigation is undoubtedly due, at least in part, to the destruction of unrecognized nematode pests. Although investigators are reluctant to use fumigation because of this stimulation, it would appear that it is better to be certain

of normal, thrifty plants than to try to balance nematode injury by fertilizers and irrigation. As more is learned about the complicated effects resulting from treatment with materials, fumigation will probably become a standard practice in plot and field experiments where susceptible crops are grown and results from experiments conducted without such preliminary fumigation will be subject to question. Of course, many problems connected with fumigation still remain to be solved, including time when the fumigants should be applied, methods of application for the various chemicals, and the possibility of combining nematocides, and fungicides. Preliminary pilot tests should be made on every experimental field.

Difficult to Control

D. E. ELLIS and C. N. Clayton, of the North Carolina Agricultural Experiment Station report the results of preliminary tests in which several chemicals with high insecticidal properties were used at various dosages to determine their potential value as soil treatment materials for the control of the root-knot nematode, *Heterodera marioni*. The chemicals used in the tests include benzene hexachloride (6% gamma isomer), DDT (50% wettable), Parathion (25% wettable), Chlordane (50% wettable), and chlorinated camphene (40%). All failed to reduce the amount of root-knot appreciably under the conditions of the test.

The test was made on sandy loam soil low in organic matter and heavily but irregularly infested with the nematode. All roots and root-knot galls from the previous crop had completely decayed. On April 29, 5-10-5 fertilizer at the rate of 1500 lbs. per acre was broadcast and disked into the soil. On April 30 the chemicals were suspended in water in a two-gallon can and sprinkled uniformly on the soil, which was immediately spaded approximately six to eight inches deep. Dosages were at the rate of 33 and 99 pounds per acre for benzene hexachloride and DDT; at 11, 33, 99.

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and 297 pounds per acre for the other chemicals. Twelve untreated plots were used as controls; two replicates of each treatment were used.

One week after treatment snap bean and okra seeds were planted in each plot, and a second planting was made a month after treatment. When the roots of the plants were examined and rated for root-knot, the results did not show any appreciable

effect for any of the materials tested. In one or more replications of each treatment the amount of root-knot approached or, in most cases, was as high as in the untreated plots. The lowest root-knot indexes, as compared with 100 for the untreated controls, were 63 for benzene hexachloride at the rate of 33 pounds per acre and 66 for Parathion at the 99 pound

(Turn to Page 75)

Louisiana Meeting Studies Cotton Pests



This column, reviewing current insect control programs, is a regular feature of **AGRICULTURAL CHEMICALS**. Mr. Haeussler is in charge of Insect Pest Survey and Information, Agric. Research Adm., B. E. & P. Q., U.S.D.A. His observations are based on latest reports from collaborators in the department's country-wide pest surveys.

By G. J. Haeussler

APPROXIMATELY 75 research and extension entomologists from 12 of the cotton-growing States and the United States Department of Agriculture met on the campus of Louisiana State University at Baton Rouge, Louisiana, November 8-10, 1948, to review the past season's experiments and experiences in cotton insect control and to summarize the results into a guiding statement that should be helpful in determining control recommendations for 1949. The summary statement, soon to become available, will be similar in nature to that issued a year ago following a similar conference that was held at Stoneville, Mississippi, in November, 1947. It will include information that should be of interest to the insecticide industry and to cotton growers relative to the present status of various insecticides, some of which are still in the experimental stage only, for the control of cotton insects. Control recommendations will be presented in a general manner and each state will undoubtedly adapt to its own conditions the data given in the summary. Suggestions developed at the conference relative to further research that appears desirable in the field of cotton insect control will also be included.

The conferees at Baton Rouge

were given a preview of a new 10 minute sound and color motion picture entitled, "Five Bandits of the Cotton Crop," recently completed by the Bureau of Entomology and Plant Quarantine in cooperation with the Motion Picture Service of the U.S.D.A. It points out the over-all losses caused by insects destructive to cotton and, with the aid of some excellent close-up shots, discusses the life history and damage of five of the more important pests, namely, the boll weevil, bollworm, cotton flea-hopper, cotton leafworm, and cotton aphid. The cotton grower is urged to take action against these "bandits" and is referred to the various official sources available for the latest information regarding methods for their destruction. Most of the photography was by E. E. Ivy, entomologist with the Division of Cotton Insect Investigations of the Bureau of Entomology and Plant Quarantine.

Copies of this film may be purchased direct from Castle Films Division, United World Films, Inc., 445 Park Ave., New York 20, N. Y. It is suggested, however, that research and extension workers who are under formal appointment with the U. S. Department of Agriculture, should write to the Motion Picture Service of the Department for authorization to

purchase copies from the De Luxe Laboratories, 850 10th Ave., New York 19, N. Y.

Peach Disease Carriers

FOUR species of stem-feeding leafhoppers have recently been incriminated as carriers of the virus disease called phony peach. This serious disease, which occurs from the Carolinas and Georgia to Texas, dwarfs infected peach trees and causes them to produce limited yields of fruit. There is no known cure for phony peach disease, so growers remove diseased trees from their orchards to save others which may not be infected. More than 1,500,000 peach trees in the southeastern United States have been destroyed since 1929 because of this disease. The leafhopper species now known to carry the disease are general plant feeders which suck the juices of peach trees at certain times of the year. The most important carrier is a species known in the south as the "cotton sharp-shooter," according to experiments conducted by the Bureau of Entomology and Plant Quarantine in laboratories and field plots at Chattanooga, Tenn., and Fort Valley, Ga. Extensive surveys of insects associated with peaches in infected and disease-free areas, many hundreds of transmission tests with numerous suspected insect species, and patient waiting for as much as three years to be certain the leafhoppers had really transmitted the disease to trees in experimental transmission plots, were only part of the painstaking effort that led to this discovery. Research is underway to find effective insecticides and to determine when they must be applied to control the disease carriers as a possible method of protecting commercial peach plantings in infected areas.

Prehatching Sprays

EXPERIMENTS recently completed in Oregon and Washington by the Bureau of Entomology and Plant Quarantine have shown that snow-water mosquitoes, a summer pest in a number of Northwestern States, can now be controlled by



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applying dry swales and low areas the previous fall with DDT and similar insecticides. The pre-hatching sprays, applied in September and October, kill off the snow-water mosquitoes (also known as mountain mosquitoes) before they reach the flying stage the next year. The feasibility of spraying in the fall to control these mosquitoes is especially important because normally the insects hatch early in the season before spray equipment can be driven over roads and trails leading to the mosquito breeding places in some areas in Oregon, Washington, California, Idaho, Wyoming, and Colorado.

Females of the snow-water mosquitoes lay their eggs on soil or duff in moist depressions, others just above the water line along shores of temporary ponds in swampy places, which are filled with snow and ice during winter months. The eggs hatch when the snow and ice melts. New broods develop with the receding snow line, and great numbers of these fierce biters attack everyone passing through infested territory.

DDT is the most effective material found for pre-hatch treatment for mosquito control. Other materials such as TDE, chlordane, chlorinated camphene, or the methoxy analog of DDT may be substituted eventually for DDT. The experiments show that oil solutions, water emulsions, wettable powders, and dusts of DDT are about equally effective for this purpose.

Mosquito development was prevented for one year in the experiments by the application of one pound of DDT per acre. Two pounds prevented their development for two years. The use of one pound of active ingredient per acre, which would require 2 pounds of 50 percent wettable powder, 10 quarts of a 5 percent oil solution, or 10 pounds of a 10 percent dust per acre, has been suggested.

Status of Some Pests Now

RELATIVELY few reports of current insect conditions are now being received except in the case of truck crop pests in southern areas.

The Mexican bean beetle decreased in abundance throughout its range in late October and early

November. Light infestations were still persisting in parts of Georgia and Florida toward the middle of November.

Cabbage caterpillar populations on cabbage and related crops continued generally light to moderate in most districts reporting. However, they were very abundant in practically all fields of cole crops in the Lower Rio Grande Valley of Texas during late October and early November. Toward the middle of November infestations were becoming moderate to heavy in S. Carolina, Ga., and Ala.

Aphid populations on crucifers have continued to show general increases in most southern areas since late October. By about the middle of November they were characterized as "moderate to heavy" in parts of

South Carolina, Georgia, Florida, Alabama, Louisiana, and California.

The salt-marsh caterpillar, which caused some damage to lettuce and sugar-beets grown for seed in the Salt River Valley of Arizona around mid-October chiefly as a result of movement from nearby cotton fields, diminished in intensity toward the end of that month.

What appears to be a well-established infestation of the oriental fruit moth was reported to have been discovered at Sawyer, south of Yakima, Wash., in late September. The report indicated that examination of the surrounding area showed only 2 or 3 orchards to be heavily infested and that the infestation decreased rather rapidly as one moved away from them.★★

Dr. Frear's New Book Covers Ag. Chemical Field

Chemistry of Insecticides, Fungicides, and Herbicides. Donald E. H. Frear. D. Van Nostrand Company, New York. 1948. \$6.

The new edition of Dr. Frear's book is a great improvement over the first. The discussions of the chemistry of the older materials have been thoroughly revised to give a much better balanced presentation. The choice of references is good. Several new chapters have been added to cover the materials developed since the publication of the first edition, and the scope has been broadened to include herbicides. In general, the stress is on the preparation, physical properties, chemical reactions, and manner of use. However, considerable space is devoted to the effect of structure on toxicity as shown by the behavior of numerous isomers and analogs of known toxicants.

The author has attempted with considerable success an up-to-date coverage of a very rapidly developing field. In order to keep all of this information in reasonable bounds it was necessary to choose for discussion rather carefully those materials and properties which seem at present most important, and the author's choice of material seems on the whole satisfactory.

A considerable section on

analytical methods for active ingredients in commercial products and for residues has been included. It seems to the reviewer that most of the readers of such a book are interested in the actual chemistry of the materials rather than in detailed laboratory procedures which can be found in the same form in the original literature, and that the space would be more valuable if used for amplified discussions of the properties of the materials.

The book is somewhat marred by a number of inaccuracies and misleading statements. For example, on p. 6 the statement is made that aerosols "partake in some measure of the properties of a gas." This statement is unfortunate without drastic qualification. On p. 65, technical DDT is stated to be more readily decomposed than the pure compound, while it has been found that the opposite may be true in the presence of certain catalysts. On p. 68 it is implied that DDT dusts are usually made by direct milling of the technical product with sufficient diluent to make a finished dust, with no mention of concentrates to be diluted later by ordinary mixing processes. On p. 83, chlordane is represented as being prepared by the chlorination of a coal tar hydrocarbon, which is questionable. Such state-

(Turn to Page 69)

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
horn flies

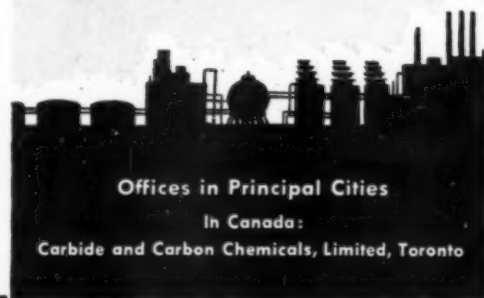
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Equipment Folder Issued

Kupfer Foundry and Iron Works, Inc., has issued a four-page bulletin describing its "K-Spray" equipment for application of weed and insect control materials. Six photographs show the equipment in actual use on tractors and jeeps, and a diagram photo shows its engineering features. This information is available from the company, 101-149 Waubesa St., Madison 4, Wisconsin.

AIF Pamphlet Available

The Agricultural Insecticide and Fungicide Association, 285 Madison Ave., New York 17, has prepared a folder entitled "How to Choose and Use Pesticides Properly," which presents ten suggestions to help consumers make the most effective use of pesticide materials. The pamphlet is available from the AIF Association.

Offers Grinder Bulletin

J. B. Sedberry, Inc., Franklin, Tennessee, has recently issued a four page illustrated folder on its "Jay Bee" tankage-fertilizer grinders. Four models are described in the folder, including both belt-drive and direct connection types. The hammer mill is described as being unusually well-balanced, long lasting, and safe to operate since the unit is constructed of steel which does not crack or break up should hard foreign matter get into the material being ground. Copies of the bulletin are available from the company, Franklin, Tenn.

DuPont Offers Booklet

A new booklet, "How to Treat" is available on request to the "Semesan" Section of E. I. DuPont de Nemours Company, Wilmington. This booklet is presented as an aid to the grower who treats all types of seeds—grains, cotton, peanuts, corn, peas, beans and vegetables. It explains why seed should be treated and de-

scribes all DuPont seed disinfectants, presenting various charts with general recommendations for all crops.

Codling Moth Literature

A review of literature on sprays to destroy overwintering codling moth larvae has been issued by the U. S. Department of Agriculture. It is designated bulletin No. E-761. Written by M. A. Yothers, Division of Fruit Insect Investigations, the bulletin begins at the earliest known reference to killing hibernating worms (Thacher, 1825) up through the latest information. Mr. Yothers observes, however, that the older literature has not been systematically reviewed, since the control of the codling moth in the hibernating stage does not appear to have been developed to a practical point until the present decade. The bulletin cites 43 references from works through 1947. It is available from the U. S. D. A. Agricultural Research Administration, Bureau of Entomology and Plant Quarantine.

Offers Pulley Catalog

Sprout, Waldron & Co., Muncy, Pa. have issued a new 16 page bulletin describing their new line of "Blue Face" pulleys and giving new list prices. The folder, bulletin #P-848 presents photos of typical installations of equipment, illustrations of pulleys, and construction details, including specifications of standard cast iron pulleys. The bulletin is available by writing the company, Muncy, Pa.

Brochure On D-C Tabs.

Mill Creek Products Co., Kansas City, Mo., has recently issued a brochure on its product, digestion-catalyst tablets. This pamphlet compares the old way of making kjeldahl digestions with the new way, through the use of "D-C tabs." This brochure is offered free upon request. Write

to the company at 329 Westport Road.

Dupont Feed Booklets Out

E. I. DuPont de Nemours & Co., Inc., Wilmington, Del. have issued two new illustrated booklets on animal nutrition, of interest to manufacturers of feeds for dairy cattle, beef cattle and sheep. One book, relating the story of "Two-Sixty-Two," a source of protein, follows the production of the feed compound from beginning to end, with numerous illustrations. The other book is a review of nutritional research on urea as a supplementary source of protein for ruminants. It contains an extensive bibliography for reference. Both brochures are available from the company's ammonia department, Wilmington, 98, Delaware.

Conn. Journal Issued

The Connecticut Agricultural Experiment Station, New Haven, has announced publication of the first issue of its new semi-annual popular journal, "Frontiers of Plant Science." Purpose of the new journal, according to Dr. James G. Horsfall, station director, is to acquaint farmers and gardeners of the State with various research developments of the Station. The journal is in magazine format, illustrated, and contains popular articles by staff members. Editor is Miss Amanda Quackenbush of the Station staff.

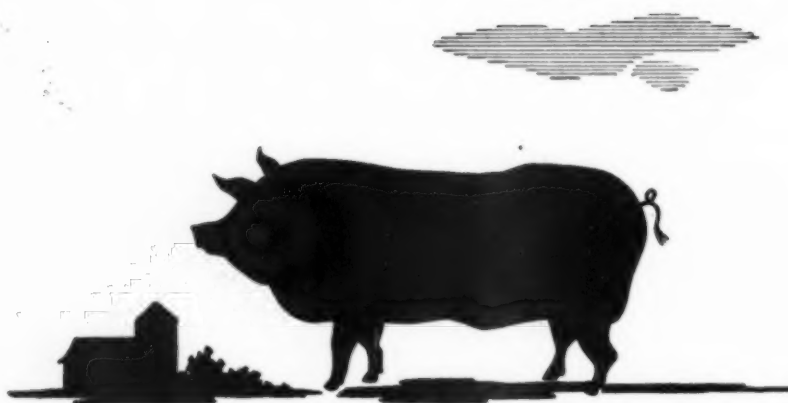
"Anti-Damp" Literature

Andrew Wilson, Inc., Springfield, N. J., has issued a bulletin on its product "Anti-Damp" for treating seedlings and cutting of flowers and vegetables to prevent damping off. The pamphlet describes use of the fungicide, and gives details of proper treatment. Copies are available from the company's office, Springfield, N. J.

Seed Fungicide Carrier

Frank J. Zink Co., 141 W. Jackson Blvd., Chicago 4, has announced a new fungicide carrier for seed treatment. The makers state

(Turn to Page 69)



this little piggie stays home

Mange is the reason. It keeps pigs from going to market—costs swine growers huge sums of money each year. Mange stunts the growth of young hogs, delays fattening, and causes some deaths. Many hogs are discounted at the market. But, there's a remedy—quick, sure and cheap. It's benzene

hexachloride wettable dust—applied as a water spray. One treatment often effects a complete cure.

Commercial Solvents is producing technical-grade benzene hexachloride of a dry, flake type. It is sold to manufacturers who grind and formulate insecticides.



AGRICULTURAL DIVISION, COMMERCIAL SOLVENTS CORPORATION, 17 EAST 42nd STREET, NEW YORK 17, N. Y.

Technical Briefs

DDT in Soil; No Harm

Small amounts of technical DDT (1 part to 32,000 parts of soil by weight) have proved effective against larvae of the Japanese beetle in cultivated land and in turf, the U.S.D.A. reports in a recent bulletin (E-737, Revised) by Walter E. Fleming. The tests, begun in 1944, were for the purpose of determining whether various plants could be grown without serious injury when their soil was treated with technical DDT. In the four years since, a total of more than ten million plants of 355 genera, 963 species, and 1,694 horticultural varieties were grown in soil treated with the authorized amount of technical DDT. Observations indicated that plants of 350 genera, 957 species and 1,688 horticultural varieties were grown successfully in the treated soil. It is pointed out, however, that the same results may not necessarily obtain in soil of other environment.

Sarcoptic Mange Control

Use of BHC and chlordane for control of sarcoptic mange in hogs has been reported by the USDA Bureau of Animal Industry. The lowest concentration of BHC successfully tested contained $1\frac{2}{3}$ pounds of the powder to 10 gallons of water, the percentage of gamma isomer in the spray being 0.13. Rapidity of mite destruction varied, of course, with the strength of spray used, the above concentration requiring 6 hours to kill the mites. The commercial BHC used showed no visible discomfort or other injury to the swine, and the musty odor of the preparation on the hogs was dissipated after about two days, but persisted longer in the shelters where the animals had been sprayed.

Chlordane, as a treatment for sarcoptic swine mange, is considered to be still in the experimental stage,

and no recommendation is made by the Bureau for its use. However, about 1,000 head of hogs were sprayed with 0.25 percent emulsion of chlordane, and the results indicated that "one application of a 0.25 percent chlordane solution when thoroughly applied, will completely clean up sarcoptic mange", in the words of the report.

Woodflour as Carrier

A book on chemical uses of wood flour has been written by W. S. Dahl and published by the Mercury Press, Northampton, England. Although for the larger portion, its description of the use of woodflour centers around plastics and cleaning products, reference is also made to its use in horticultural insecticides as a carrier. Of a number of materials tested, only one gave promise of being useful as an insecticide carrier, the chapter states. This is a grade of oakwood flour of 80 mesh. "This material possesses the desired properties and has stood up well under practical tests," it says. "Beechwood and softwoods flour, 80 mesh or less, has also found a limited use for this purpose, due more to its physical properties rather than chemical. Thus it would seem that these ligno cellulosic materials possess a certain application to horticulture, and when more different types become available they may be more widely used."

Small Spraying Outfit

Michigan State College horticulturists have constructed a simple spraying apparatus for applying 2,4-D at rates of from 5 to 10 gallons per acre, it is reported. The outfit is described as being constructed from a common three-gallon hand sprayer mounted on a hand garden cultivator and equipped with a spray boom. The sprayer can be adapted to specific crops such as corn and gladioli

where 2,4-D is to be applied between the rows and away from the crop, it is reported. In addition to its use for applying 2,4-D, the outfit may be used for applications of other materials in concentrated form, including insecticides and fungicides.

2,4-D Experiments

In an effort to determine if 2,4-D, used as a selective weed spray in small grain might injure the crops, Wyoming Agricultural Experiment Station ran a series of tests at Laramie. Among findings listed in the station's 57th annual report are the following:

(1) Treating cereals when weed-free with 2,4-D gave a reduction in grain yield. However, if the 2,4-D was applied at or before jointing, or after heading of the grain, as much as three pounds of 2,4-D per acre (0.15 per cent solution at 250 gallons per acre) could be sprayed for weed control in spring wheat and barley without a serious reduction in yield. (2) Spraying barley and spring wheat in the boot stage significantly depressed yields. (3) Greater head abnormalities (other than sterility) of wheat and barley occurred in plants sprayed at or before jointing stage. (4) In a comparison of several rates of application, the grain plots treated with only one pound of 2,4-D per acre produced more grain than any of the more heavily sprayed plots. (2) The 2,4-D slightly reduced the germination of some grain produced on the plots, with one sample of barley germinating 11 percent below untreated barley. There was a slight trend indicating that the more 2,4-D used, the greater will be the effect on germination of the resulting grain when it is planted as seed.

BHC for Scabies Control

Dipping scab-infested sheep only once in a solution containing one pound of wettable BHC per 100 gallons of water was sufficient to destroy all mites, although some mites were still alive 36 hours after dipping, the Bureau of Animal In-



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FUNGICIDES: FERMATE®, ZERLATE®, and PARZATE® Organic Fungicides, Copper-A Fixed Copper, SULFORON® Wettable Sulfur, SULFORON®-X Micro-fine Wettable Sulfur, KRENITE® Dinitro Spray, Sulfur Paste, Bordeaux Mixture.

OTHER MATERIALS: 2,4-D Weed Killers, AMMATE® Weed Killer, Du Pont Spreader-Sticker, Spray Adhesive, PARMONE® Pre-Harvest Fruit Drop Inhibitor.

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dustry reports. The percentage of gamma isomer in this concentration was only 0.0075 percent, but by doubling the strength of the dip (adding 2 pounds of the commercial powder to every 100 gallons of water) all mites were destroyed in about 2 hours. Increasing the strength of the dip to 4 and even 8 pounds of the acaricidal powder per 100 gallons of water, did not accelerate the destruction of the mites appreciably. For practical purposes of eradication of sheep scabies with BHC dips, 4 pounds of wettable powder (5 to 6 percent gamma isomer) per 100 gallons of water appears to be adequate. This concentration has been found in field trials to destroy all mites on shorn and unshorn ewes, bucks and lambs, and to resolve the lesions.

Seed Treatment Tests

Three experiments were conducted at Lafayette, Ind. on effect of fungicidal treatment of seed corn. Lots treated with "Arasan," "Phygon" and "Semesan Jr." produced significantly greater yields than the untreated control seed lot. "Arasan"-treated lots yielded 92.9 bushels per acre, while untreated control lots averaged 82.1 bushels per acre.

Mist For Fungicides

Tests with the mist blower method for control of anthracnose and other fungus plant diseases have proved reasonably satisfactory, according to Drs. F. S. Potts of the U.S.D.A. Bureau of Entomology and Plant Quarantine, and A. E. Dimond, Connecticut Agricultural Experiment Station, New Haven. Although experiments have been made against anthracnose which attacks sycamores and London planes, further tests will have to be made before full knowledge is available about the scope of such work. It will be necessary to make tests with other concentrated fungicidal sprays, and to observe results with other diseases of plants, Drs. Potts and Dimond report. Although the results thus far open a promising field for further experimen-

tation and investigation, the workers do not regard the method as promising for control of the fungus which causes Dutch elm disease, in which spores are deposited under the tree bark where mist blown fungicides find it difficult to penetrate.

Develops "Key" to Bacteria

Dr. H. J. Conn, New York State Experiment Station, Geneva, has worked out a "Key to Predominant Groups and Species" of bacteria in soil to aid in identifying the predominant species of soil bacteria when they are observed under a microscope.

The method has two major divisions. In the first group are placed all soil bacteria which quickly liquefy a gelatin media in which they are grown. In the second large group are those forms which produce small colonies on a gelatin media with little or no liquefaction. Each group is further subdivided on the basis of size, form, color, and other characteristics of the colonies produced by the different species. Dr. Conn states that there are of course many soil bacteria which require special media for their growth, but he believes that his key will help to identify the forms most commonly met in soil studies.

Cotton Pests Discussed

The second annual Cotton Insect Control Conference was scheduled to be held at the Henry Grady Hotel, Atlanta, Ga., on December 6 and 7. Claude L. Welch, Director of the Division of Cotton Production and Marketing of the National Cotton Council of America stated in November that the meeting would seek to bring together all the latest research findings on the control of cotton insects, so that a coordination of plans for 1949 may be brought about. The Bureau of Entomology and Plant Quarantine and the co-operating state experiment stations were to review results of experiments during the 1948 season, and had planned to make recommendations for 1949 on the basis of this year's findings. The Agricultural Education Agencies were to present suggested

ways and means to bring the program to the farmers.

Manufacturers of agricultural insecticides and application equipment were to have displays at the meeting, according to the previous program. In commenting on the program, Mr. Welch stated that "It is hoped that with this coordinated thinking and planning, all groups may join together in a vigorous program of Cotton Insect Control in 1949, with resulting increased efficiency and income for the cotton products of the South."

Fungicide Tests Made

Studies were conducted at the Morris Arboretum at Philadelphia, and in Delaware, using Bordeaux-8-8-100. "Zerlate" (zinc dimethyldithiocarbamate) 1½-100. "Fermate" (ferric dimethyldithiocarbamate) 1½-100. "Parzate" (zinc ethylene bisdithiocarbamate) 1½-100, "Bioquin 1" (copper-8-quinolinolate) 1-100, and "Puratized" (phenyl mercuri triethanol ammonium lactate) 1 pint-100. Leaf blotch (*Guignardia aesculi*) of horsechestnut and buckeye was controlled with Bordeaux, "Zerlate" and "Parzate," while "Fermate" and "Puratized" gave only slight control. "Zerlate," "Parzate" and "Puratized" controlled leaf spot (*Gnomonia ovata*) of hickory: "Fermate" failed. "Fermate" controlled anthracnose (*Gleospodium fructigenum*) on sassafras. "Bioquin 1" and "Parzate" gave excellent control of leaf blight (*Entomosporium maculatum*) of pear. Leaf blight (*Entomosporium theuemenii*) of English hawthorn was controlled by Bordeaux, while "Puratized" gave control only until mid-summer. No twig blight (*Sphaeropsis* sp.) was present in red oak treated with Bordeaux or "Puratized." "Parzate" only slightly controlled anthracnose (*Gleospodium apocrytum*) of maple. Twig blight (*Myxsoporum* sp.) of dogwood was controlled by any treatment. Control of tip blight (*Sphaeropsis ellisii*) of Austrian pine was erratic with all treatments. "Puratized" failed to burn-out quince rust (*Gymnosporangium claviceps*) on cedar.

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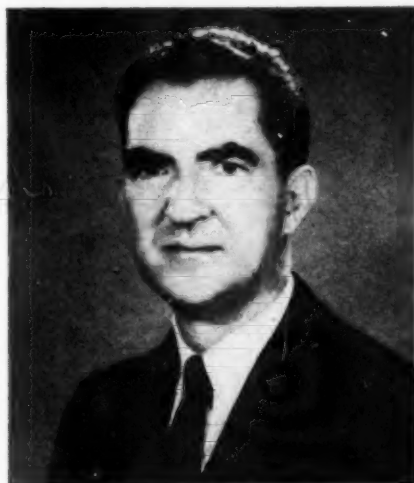
INDUSTRY NEWS

Dr. Chester Joins Battelle

Dr. K. Starr Chester, plant pathologist, has joined the staff of Battelle Institute, Columbus, Ohio. He will head the Institute's research program in the agricultural sciences and in plant and animal nutrition.

Dr. Chester was until recently head of the Department of Botany and Plant Pathology and director of the Research Foundation of Oklahoma Agricultural and Mechanical College. He had been associated with the College for the past eleven years, prior to which he conducted research for five years at the Rockefeller Institute for Medical Research, Princeton, New Jersey. He holds Bachelor of Arts and Master of Science degrees from Boston University, and Master of Arts and Doctor of Philosophy degrees from Harvard. He has studied additionally at the technical university at Zurich, Switzerland.

According to Battelle Director Clyde Williams, the appointment of Dr. Chester to the Battelle staff is a



DR. K. STARR CHESTER

preliminary move toward the expansion of the Institute's research activities in the agricultural field.

AIFA Announces Plans for Expansion

A NEW membership policy has been adopted by the Board of Directors of the Agricultural Insecticide and Fungicide Association, New York, which will result in the Association's broadening its base of operations to include not only basic producers, as has been done in the past, but reprocessors and re-mixers; custom applicators; equipment manufacturers; suppliers; regional pesticide associations; dealers; and allied industries. The Directors also voted to change the group's name to "National Agricultural Chemicals Association," and to establish its office in Washington, D. C. as soon as the move can be accomplished.

In a release explaining the new policies of the Association, the AIF points out that the rapid growth of the pest control industry during the past six years has been accompanied by numerous changes which have brought increasing problems along with a heightened public interest. With this as a background, a special

committee from the Board of Directors was appointed at the Association's September meeting at Spring Lake, N. J., and its recommendations for the expanded program were adopted unanimously by the Board in New York, November 18.

Groups interested in pest control have shown an increasing desire to become affiliated with the AIF association, explains George F. Leonard, Tobacco By-Products & Chemical Corp., Richmond, Va., AIF president. The AIF Board of Directors has recognized this trend and the newly-adopted policy is the result of this demand.

In discussing the new groups to be invited into membership in the new National Agricultural Chemicals Association, president Leonard makes it clear that the present membership will not be affected by the expansion program, beyond benefiting from the closer relations established with other segments of the industry and from the expanded services now made possible.

New groups to be invited will include custom applicators which in turn includes aircraft operators. "This field has grown tremendously in recent years," comments Mr. Leonard, "providing a means for the expansion of pest control. However, the lack of a coordinated program of information is proving a serious handicap, especially to the aircraft operators . . ." He continued by pointing out that the proper development of this section of the N.A.C.A. should help overcome the current trend toward increasing legislative restrictions.

Equipment manufacturers, upon whom the basic producer and re-mixer is dependent, will be invited into membership. "Liaison with this group is increasingly important," Mr. Leonard states. "Many of the new chemicals present new problems in application which must be solved both from the standpoint of pest control as well as hazards to the user and his crops," he said.

The addition of suppliers to the membership will permit closer contact with the manufacturers of spreaders, container, diluents and raw materials, to make for better understanding of industry's problems and needs.

The new organizational setup will affiliate with various regional pesticide associations to provide for coordinated industry action, it is pointed out. The trend toward divergent views should be eliminated, and local problems given more adequate treatment through this cooperation.

Dealers, state and federal agricultural workers, representatives of farm groups and scientists will also be invited to belong to the new N.A.C.A. as individuals, a distinct departure from previous membership policies. Likewise the invitation to allied industries such as food processors, is expected to contribute materially to the solution of mutual problems.

Mississippi Chemical Corporation is Formed



Officers of the newly-formed Mississippi Chemical Corporation: Front row, (L to R) John S. Williams, president; Mrs. Mamie F. Marshall, acting secre-

tary-treasurer. Back row, (L to R) Owen Cooper, executive vice-president; Charlie McNeil, 2nd vice-president; and Charles Whittington, 1st vice-president.

MISSISSIPPI Chemical Corporation, new multi-million dollar enterprise, announced on November 27 that the corporation's board would meet on December 8 to select an engineering firm for construction of a nitrogen plant in Mississippi. The board was also to review progress of the stock-selling campaign, and was to hear a report that sufficient funds are available to assure construction of a nitrogen plant large enough to take care of all commitments made to stockholders. The plant will be owned and controlled by some 6,000 farmers of the State of Mississippi, principal consumers of the corporation's future output.

President of the corporation is J. S. Williams, Yazoo City, Miss. Executive vice-president is Owen Cooper, Jackson, Miss.; and general operations manager is Leroy Thompson. The twenty-two man board, all from Mississippi, include the following persons: C. E. Denton, Shelby; R. C. Malone, Pace; George D. Perry, Jr., Maud; R. E. Chapman, Lambert; Leroy Percy, Greenville; G. C. Cortright, Jr., Rolling Fork; George Crawford, Madison; F. A. Anderson, Sr., Gloster; H. R. McIntosh, Picayune; Jasper Blount, Hickory; Ransom E. Aldrich, Michi-

gan City; Charles Whittington, Greenwood; John W. Taylor, Sunflower; Billy Duncan, Inverness; Hudson Kyle, Clarksdale; H. P. Sullivan, Walls; Charles McNeil, Jackson; J. B. Cunningham, Brooksville; M. T. Reid, Belzoni; John Sharp Williams, Yazoo City; Charlie Maddox, West; and Owen Cooper, Jackson.

New Toxicants Screened

The U.S.D.A. has reported that some 21 analogs of DDT and 19 other closely-related materials are being screened for possible use in fly and mosquito control. The steadily increasing resistance of flies to the residual killing effects of DDT is stated as being the impetus for stepping up research for newer toxicants.

NAIDM Meeting Held in NY

December 6 and 7 was the date set by the National Association of Insecticide and Disinfectant Manufacturers, Inc. for its 35th annual meeting at the Hotel New Yorker, New York. Although various committees and the Board of Governors of the Association were to meet on Sunday, December 5, the meeting proper was scheduled to begin Monday morning. The advance program

called for discussions on low-pressure aerosols, a discussion on housefly resistance to DDT, and market reports on insecticides. The annual dinner and floor show was to be held in the Grand Ballroom Tuesday night.

Ohio Meeting Held

The Ohio Pesticide Institute planned to hold its second annual meeting at Columbus, December 1 and 2. A several-phase program was to include insecticides, fungicides, rodenticides, fumigants and herbicides. The advance program included panel discussions on each subject and a dinner program on Wednesday evening, Dec. 1, with Lea S. Hitchner, AIF Association, as speaker.

The panel on fungicides was to include talks by H. C. Young, J. D. Wilson, and H. F. Winter, all of Ohio Agricultural Experiment Station, Wooster; and W. G. Stover of Ohio State University, Columbus. Insecticide subjects were to be covered by T. H. Parks of the Ohio State Extension Service, and C. R. Cutright, J. P. Slesman and Roy Rings of the Ohio Exp. Station.

A panel on application equipment and methods on Wednesday evening, was to be under the chairmanship of Frank Irons, U. S. Department of Agriculture, with speakers including Drs. Young, Wilson and Cutright of the Station.

Thursday's session was to include a panel discussion on rodenticides and fumigants, with Dr. Parks as moderator. Speakers on the program included C. R. Neiswander, and Dr. Wilson, Ohio Agricultural Experiment Station; D. A. Biron, Dow Chemical Co., Midland, Mich.; and S. J. Hastings, Shell Oil Co.

The final session, on herbicides, was to be in charge of co-moderators, H. E. Bruner, Monsanto Chemical Co.; and Walter Hall, Shell Oil Co. Speakers on the advance program included C. J. Willard and E. K. Alban of Ohio State University; Drs. Wilson and Young of the Experiment Station; L. L. Baumgartner, B. F. Goodrich Co.; E. D. Witman, Sherwin-Williams Co.; and Keith C. Barrons, Dow Chemical Co.

Fertilizer Distribution Told

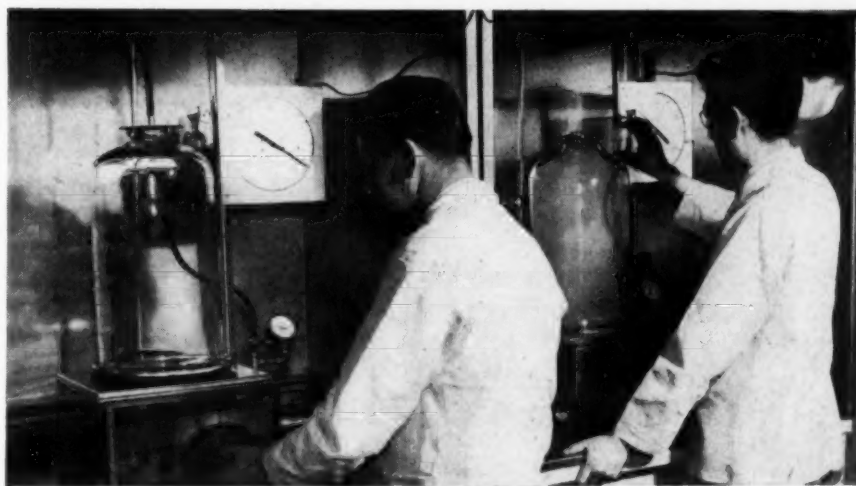
Illinois Farm Supply Co., Chicago, distributed 208,628 tons of plant food to its members in 1947, it was revealed in a report submitted at the cooperative's annual meeting in Chicago last month. This was an increase of 14.8 percent over the 179,393 tons handled in the previous year. Difficulty was experienced through shortages of essential elements and demand for the co-op's goods far exceeded supply.

At Fairmont City, Ill., the co-op's new fertilizer factory is now about half-finished, it was announced, and construction is expected to be completed early in 1949. Capacity of the new acidulating and mixing facilities will be 40,000 tons of mixed goods and 20,000 tons of superphosphate annually.

Horticulturists Meet

The Kansas State Horticultural Society was to hold its annual meeting December 2 and 3 at Kansas City, Kansas. The meeting was to be in conjunction with the Kansas Sweet

Wisconsin Alumni Research Screens Toxicants



The Wisconsin Alumni Research Foundation, Madison, Wis., has announced the availability of its testing laboratories for insecticides, fumigants, fungicides and bactericides. The laboratory has been set up as a part of an extensive program of providing testing services for manufacturers. It evaluates various insecticidal materials, agricultural dust and spray materials, screens unknown compounds, studies toxicity in

warm blooded animals, and carries on other studies including evaluations of residual sprays and determinations of the phytotoxicity of insect toxicants. The W.A.R.F. also offers services in testing the compatibility of insecticides with other chemicals. Above is an apparatus (left) for evaluating agricultural dust, and at the right is the settling mist apparatus used in evaluating oil sprays.

Potato Association. Speakers named on the advance program included

entomologists, fruit growers and extension workers.

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Vice-President, Pennsylvania Salt Manufacturing Co., Tacoma, Wash.

RUSSELL B. STODDARD

Coordinator of Insecticide Operations, U. S. Industrial Chemicals, Inc., New York.

F. S. WASHBURN

Director, Agricultural Chemicals Division, American Cyanamid Co., New York.

BYRON P. WEBSTER

Vice-President, Chipman Chemical Co., Inc., Bound Brook, N. J.

P. W. WIEDER

Western Division Manager, Stauffer Chemical Co., San Francisco, California.

Reprints of this advertisement, approximately 8½ x 11 inches, are available through the AIFA at \$6 per 1,000. On orders of 1,000 or more, the supplier's firm name may be imprinted in a space provided.

How to CHOOSE and USE PESTICIDES PROPERLY

Here are 10 suggestions by the AIF Association to guide consumers in choosing and using pest control chemicals. Following these rules will mean more effective and safer use of such materials.

1. Do some advance thinking about your pest problems. Consider the possible insects or diseases in relation to your specific crops or animals and their surroundings.
2. Remember that there are many long-established as well as new chemicals for controlling pests. Compare their relative merits and weaknesses. There are many uses for all pesticide products. There are also some unsolved problems still being investigated by the industry, and answers will be made as soon as possible.
3. Read up on your problem and learn to distinguish recommendations by competent authorities as against mere reports of isolated research results or unofficial suggestions.
4. Find out about the possibilities of secondary problems, such as residues and off-flavors. Consider timing of applications, dosages, methods of residue removal and so on as means of overcoming secondary problems.
5. Select a reliable manufacturer as your source of supply and discuss your particular problems with an accredited representative. Do the same with federal and state agricultural experts in your locality.
6. All economic poisons in interstate commerce must be registered under federal law. The federal law, as well as many state laws governing sales of pesticides, are for your protection. Be sure the products you buy comply with all regulations.
7. Determine the type of application equipment you will need and investigate the possibilities of damage to neighboring crops from drift. Accuracy of dosage is essential with modern chemicals.
8. If your food crop is intended for processing, discuss your control program with the food processing company. Processors know how to handle products on which many kinds of sprays and dusts have been used. Do not make it necessary for them to reject your product.
9. Read labels and accompanying literature carefully. Read the warnings and directions—and OBEY them. Do not overdose. All pesticides should be handled with care. Some materials may require the use of masks or gloves during application. The industry, in co-operation with federal and state agencies, has gone to much expense and trouble to give you complete warnings and precautions aimed at one thing: your protection.
10. Keep a record of your operations: material used, dosage, date of application and method, crops, weather conditions, results and any other information that may be helpful in planning your future operations.

Lea S. Hitchner

Executive Secretary

Agricultural Insecticide & Fungicide Association

285 Madison Ave.

New York 17, N. Y.

OFFICERS

GEORGE F. LEONARD, President

A. W. MOHR, Vice-President

LEA S. HITCHNER, Executive Secretary and Treasurer

A THREE-SIDED meeting is to be held at Baton Rouge, Louisiana on January 31 and February 1 and 2 when the Cotton States branch of the A.A.E.E.; the Southern Weed Conference; and the Association of Southern Agricultural Workers meet.

The meeting of the Cotton States Branch is scheduled to begin promptly at 9 a.m. on January 31, with a paper-reading session. Charles E. Smith, Department of Entomology, Louisiana Experiment Station, University Station, Baton Rouge, will handle reservation requests, it is announced. Members of the industry from all parts of the nation are invited to attend, according to John T. Creighton, chairman of the Branch.

The second Southern Weed Conference will begin on January 31 also, according to Glenn C. Klingman, Associate Professor of Agronomy, North Carolina State College, secretary of the group. He states

Baton Rouge to be host to Cotton States Branch, A.A.E.E.; Southern Agricultural Workers Ass'n; and Southern Weed Control Conference in 3 day meeting next month

further that cooperative weed research plans have been submitted to the Directors of Southern Agricultural Experiment Stations for consideration. Discussions of such will be a feature of the weed control meeting.

Chairman of the program committee is Dr. G. M. Shear, plant physiologist at the Virginia Agricultural Experiment Station. He indicates that there will be displays of chemicals and application equipment at the weed meeting. (Companies desiring to exhibit such merchandise should contact Dr. L. O. Brown, Professor of Botany, Louisiana State University for details).

Dr. Brown is president of the Southern Weed Conference; Dr. O. A. Leonard, Plant Physiologist, State College, Miss. is vice-president, and Mr. Klingham, secretary-treasurer. The Southern Weed Conference includes the states of Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North and South Carolina, Oklahoma, Puerto Rico, Tennessee, Texas and Virginia.

The program of the Association Southern Agricultural Workers had not been announced at press time, but was expected to be available for the next issue.

Dr. L. O. Brown
President, Southern Weed Conf.



O. A. Leonard
Vice-Pres., Southern Weed Conf.



Glenn C. Klingman
Secretary, Southern Weed Conf.



Utah Horticulturists Meet

The Utah State Horticultural Society will hold its annual convention at Hotel Utah, Salt Lake City, January 10 and 11, 1949, it has been announced by Arvil L. Stark, secretary. The advance program, subject to confirmation by some of the invited speakers, includes a luncheon talk by Hon. J. Bracken Lee, Governor of Utah; a talk by Judge J. A. Howell, Ogden,

Utah, president of the Horticultural Society; "Supplying Minor Elements to Fruit Trees in Utah," by F. B. Wann, U.S.D.A., Logan, Utah; "Apple Pest Control Experiments," by C. J. Sorenson, Logan; "How the Northwest Controls Fruit Pests with New and Old Insecticides," by E. J. Newcomer, Yakima, Washington; and "The Stone Fruit Virus Situation in Utah," by B. L. Richards, Logan.

Other papers will discuss

marketing problems, and two movies will be shown covering peach production and other agricultural subjects. In addition to Judge Howell, president, and Mr. Stark, secretary, vice-president of the Society is A. Ray Elkins, Provo, Utah.

Int. Minerals Advances 2

International Minerals and Chemical Corporation, Chicago, recently announced the appointments of Ben E. Meguschar and Joe F. Stough.

Mr. Meguschar, who was northern general manager of the plant food division for the past two years, is now assistant to Maurice H. Lockwood, vice president and head of the plant food division.

Mr. Stough, who was mid-western district sales manager for the potash division, succeeded Mr. Meguschar as northern general manager.

New Chemical Co. Forms

A new company, Chipola Chemical Co., Marianna, Fla., was recently formed. The officers are W. H. Harrison, president; G. A. Jenkins, vice president; D. D. Bevis, secretary and treasurer; L. E. Johnson and W. B. Reddock, directors.

The company will manufacture a complete line of agricultural insecticides, fungicides and herbicides, to serve the southeastern area of the United States. It will specialize in chemicals for peanut growers since Marianna is located in the heart of the peanut section. It will also maintain turf and pasture specialists and will manufacture chemicals for the improvement of turf on golf courses and pastures.

Lion Declares Dividend

Lion Oil Company, El Dorado, Arkansas, recently declared a regular quarterly dividend of 75 cents per share on its common stock to be paid December 15, to common stockholders of record at the close of business November 30, 1948.

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Goldberg to New Post

Melvin Goldberg has announced the establishment of the Pesticide Advisory Service, which will specialize in chemical sales in the fields of agricultural insecticides, fungicides, and herbicides. In addition, the company will engage in market service and consultations for manufacturers of chemicals and related materials used in these agricultural fields. The offices, located at 37 Wall St., New York, were to be opened on December 1st.

Mr. Goldberg has been associated for the past three years with Geigy Company, Inc., New York. Prior to that time he was in Washington, D. C. with the Insecticide and Fungicide Unit, Chemicals Bureau, War Production Board. During the latter part of his association with the War Production Board he served as chief of the Unit.

A graduate chemist, he received his A. B. from Johns Hopkins University and his Master's Degree from Georgetown University. Before his work in World War II, he was employed by various Government research organizations including the Bureau of Animal Industry and the National Institute of Health.

Pacific Show in November

The second Pacific Chemical Exposition, to be held by the California Section of the American Chemical Society will be held November 1-5 at the San Francisco Civic Auditorium, according to Marcus W. Hinson, manager.

N. J. Annual Report Issued

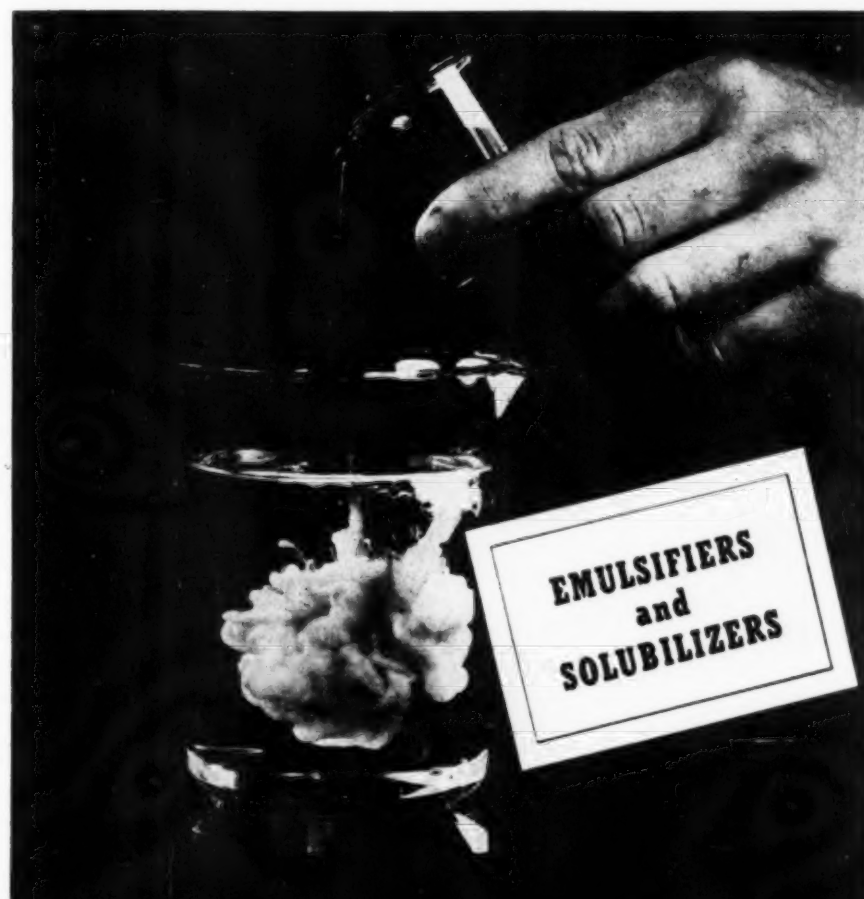
The 1946-47 Annual Report of the New Jersey Agricultural Experiment Station, New Brunswick, N. J., has been issued within the past month. It reports progress in experiments with chemical weed control, and gives the answers to a number of questions regarding pre-emergence treatments, and concentrations of 2, 4-D to be used in certain applications. The station reports that it does not recommend pre-emergence control of weeds in corns with 2, 4-D,

although the future looks promising. "There are as yet only limited experimental results available," the report says. "It is known that identical treatments on different soils give variable results. Hybrids differ in their susceptibility to injury, and their individual reactions remain to be determined by actual test. The relationship of soil temperature and organic matter content to the effectiveness of the treatment has yet to be established. Until more is known


about these things, pre-emergence control of weeds in corn will remain experimental." Other sections of the 112-page booklet include reports on soils, plants, animals, economics, engineering, etc.

Louis Ware RR Director

Louis Ware, president of International Minerals and Chemical Corp.; Chicago, was elected a director of the Illinois Central Railroad Co. on November 30.



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Sprayer Short Course

The first short course ever held in Illinois for commercial spray operators is scheduled for January 12-14 at the University of Illinois, Urbana. H. B. Petty, extension entomologist and program chairman, states that there will be no registration fee, and the conference is open to both ground and airplane operators.

Wednesday, Jan. 12, is set aside for ground operators; the next

day for both ground and airplane operators, and the third and final day, for airplane operators. Joint sponsors of the meeting are the College of Agriculture, the Institute of Aeronautics, and the State Natural History Survey.

Topics on the tentative program include problems in spraying and dusting weeds, orchards, livestock, trees, lawns and shrubs, plus numerous discussions on proper spray-

ing equipment. The aerodynamics of dusting crops, spraying grasshoppers with chlordane and dusting corn borers with DDT are some of the topics in which airplane operators are expected to be particularly interested. For ground sprayers, the use of 2,4-D for weed control, an all purpose orchard spray, fly control with DDT, and best types of nozzles, pumps and gauges will be discussed. Mr. Petty indicated that questions turned in during the conference will be answered informally.

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"Hi-Gam" Production Up

Pennsylvania Salt Manufacturing Co., Philadelphia, has announced the availability in commercial quantities of its new high gamma content benzene hexachloride product, "Hi-Gam" W-25. Containing 25 percent substantially pure gamma isomer as its active ingredient, the material is designed for use in water suspension sprays, or as a base for the formulation of finished insecticide dust.

Bemis Names Mangelsdorf

Bemis Brothers Bag Co., St. Louis, has appointed T. R. Mangelsdorf as district sales supervisor of their Omaha Sales Division, which includes portions of Iowa, South Dakota and Nebraska.

Simanton to Phoenix

Dr. William A. Simanton has recently joined the Agricultural Chemicals Co., Phoenix, Arizona, as technical director and assistant to the president. He was formerly with the Shell Oil Co., San Francisco, as senior entomologist. Dr. Simanton has been working with new chemicals for agriculture for the past 15 years and has taken numerous products through from the test-tube stage to large-scale commercial use.

Soil Co. Names Nadeau

Ross Nadeau, Maplewood, N. J., was recently elected president of American Soil Builders Co., Inc., manufacturers of "Alkemi" soil builder, Newark, N. J. Mr. Nadeau has been active in agricultural pursuits for the past 30 years.

AGRICULTURAL CHEMICALS

Discuss '49 Recommendations at Cornell Conference Nov. 10-12

RESEARCH reports on agricultural insecticides and fungicides and a discussion of 1949 proposed recommendations to growers comprised the greater part of the three-day annual conference sponsored by the New York State Experiment Station at Cornell University, Ithaca, N.Y., on November 10, 11, and 12. The program was under the direction of Dr. Charles E. Palm and Dr. L. M. Massey. Registration at the meeting totaled 288 persons from industry and experiment station personnel, representing twenty states and four foreign countries.

Two sessions on application equipment were held in the afternoon and evening of November 10 under the chairmanship of O. C. French at the Plant Science Build-

ing, Ithaca. The general sessions of the conference which covered Nov. 11 and 12 were held in the Bibbins Auditorium of the G.L.F. Building at Ithaca at which 33 papers were presented. Vegetable insect control recommendations for 1949 were given by Dr. R. L. Leiby of Cornell, and vegetable disease control recommendations by Dr. C. Chupp of Cornell, the latter also including potato recommendations. Dr. W. A. Rawlins gave the potato insect control recommendations. Fruit insect control recommendations were given by Dr. E. H. Smith, and disease control by Dr. W. D. Mills.

L. S. Hitchner, executive secretary of AIFA, discussed the criticism to which pest control practices and materials are being subjected by

some of the medical associations and public health officials, and warned that this was likely to become more intense and constituted a serious threat to the future of economic agricultural pest control. He suggested greater caution in recommendations and in the use of insecticides and fungicides and outlined the need of a broad educational program to reach the growers if future hazards are to be reduced and new ill-chosen legislation avoided. He outlined the 10-point bulletin recently issued by AIFA on precautions in pesticide use and discussed the new joint committee of public health and medical officials, canners, frozen food packers, USDA and others who are studying the problem.

A dinner of the gathered representatives of industry and science was held on Thursday evening, Nov. 11, at the Hotel Ithaca, with Dr. L. M. Massey presiding. A program of motion pictures taken by Dr. Palm on insect control problems and methods, was enthusiastically received following the dinner.

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Pacific Insecticide Institute Meets in California

By Dr. Alvin J. Cox

THE annual Fall meeting of the Pacific Insecticide Institute was held on Tuesday, October 26, 1948, in Hotel Claremont, Berkeley, California. The morning session was for members only, but the open meeting began at 12:30 P.M. with a luncheon furnished by the P.I.I. to its 150 members and guests. Those

present included representatives of the California economic poisons industry, together with representatives from the University of California at Berkeley and Davis, the U.S. Department of Agriculture Production and Marketing Administration, the Industrial Accident Commission, the California Department of Agri-

culture, and industry representatives from other sections of the U.S.

A call to order and introduction of guests for the afternoon program was made at 2 P.M. by Chairman, David T. Prendergast. The first speaker was Dr. E. L. Griffin, Acting Chief, Insecticide Division, Production and Marketing Administration, Livestock Branch, U.S. D.A., Washington, D. C. Although some difficulties have been encountered with regard to federal registration, he said, the cooperation of industry, has reduced many obstacles and they may be removed still further by the introduction of a P.I.I. representative to work with the industry on the west coast.

Carl E. Rodegerdts, Woodland, California, attorney, counsel for the Airplane Association and for the Tomato Growers Association, spoke on the "Legal Aspects Surrounding the Manufacture, Sale and Use of Insecticides and Herbicides." Section 150 of the Agricultural Code passed in 1933 is the enabling act that authorizes the California Department of Agriculture to make regulations applying to these operations, he pointed out. In 1938, a regulation was passed to provide for the revoking of licenses of airplane custom operators when their drifting insecticide causes damage elsewhere. Operators of ground equipment were also shown to be responsible for damage from the drift of calcium arsenate.

Mr. Rodegerdts asserted that regulations alone will not solve the problems involved, but before anything may be done, one must first determine what the problem is. Successful agriculture requires the use of protective chemical products, he continued, but added that these must be applied with good judgment.

The problem of residual toxicity was discussed by Dr. Stanley B. Freeborn, assistant Dean, College of Agriculture, University of California. He reported that the residual toxicity problem is being studied by a National Committee representing organizations which, although not in the industry, are friendly to it, and are much concerned about the

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GY-BEN
(BENZENE HEXACHLORIDE)
A benzene hexachloride formulation containing 85% gamma isomer.

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A dust base containing 40% chlorinated camphene primarily for use in preparing dusts for cotton-post control.

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A chemically stable insoluble basic copper sulphate containing 53% metallic copper for use in preparing sprays or dusts.

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And don't overlook these widely used Geigy DDT compositions. They also represent opportunity to manufacturers and processors of packaged insecticides for the retail trade.

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A solution containing 30% Geigy DDT (by weight) for dilution with liquids, to control flies, mosquitoes, bedbugs, cockroaches, fleas and certain other insects.

GESAROL* VD-50

A finely-ground powder containing 50% Geigy DDT. For general agricultural use after addition of diluents to formulate DDT dusts adapted to control specific pests.

Geigy Company, "Originators of DDT Insecticides" are now broadening their base of operation in the field of pesticides. These three new Geigy products have been tried and proven. They are of traditional Geigy quality. Use them with confidence in dust mixtures for agriculture. They will help you build business. Your inquiries are invited.

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possibility of further restrictive legislation being enacted. Dr. Freeborn stated that in many cases there should be a working arrangement with regulatory authorities until such a time as there is an experimental basis for formal regulation. Otherwise, growers, canners and processors face serious hazards in the use of toxicants. Data are needed on every material at every dilution on all crops, he said. These cannot be obtained quickly, which makes it necessary to adopt a concerted and methodical procedure to gather facts. Since thirty percent of the fruit and vegetables produced in the U.S. are grown in California, investigators in that area carry much of the responsibility of knowing answers to questions about toxic residues, since these crops require a major portion of insecticides used in the State.

"Health Hazards of the Insecticide Industry" were discussed by Dr. Charles H. Hine, assistant professor of Toxicology, University of California Medical Center. He told the group that the medical profession is short on factual information regarding the toxicity of many insecticidal substances to human beings. He pointed out the need for further basic research, and for the correlation of factual information already available.

K₂O Deliveries up for '48

The American Potash Institute, Washington, D. C., announces that the five major American potash producers delivered 511,819 tons of potash salts containing an equivalent of 271,494 tons K₂O during the third quarter of 1948, representing an increase of 17% in salts and 16% in K₂O over the same period of 1947.

Joins Amer. Chem. Paint

Maurice Turner, formerly associated with the Insecticide Division of U. S. Industrial Chemicals, Inc., New York, has joined the staff of the American Chemical Paint Co., Ambler, Penna.

Northeastern Weed Conference Set for Jan. 5-7; Prominent Speakers Scheduled

THE advance program of the Northeastern Weed Control Conference to be held January 5-7, at the New Yorker Hotel, New York, has been announced by Dr. Benjamin Wolf, Seabrook Farms, Bridgeton, N.J., secretary of the Conference. The meeting will begin at 9 a.m. Wednesday, Jan. 5, in charge of Dr. Gilbert Ahlgren, Rutgers University, New Brunswick, N.J., president of the N.E. Conference. The morning session will be as follows, according to the program:

Welcome by the Chairman, Gilbert Ahlgren, Rutgers University, New Brunswick, New Jersey. Report of Allied Conferences; "Plans for coordinated weed research," by K. S. Quisenberry, Bureau of Plant Industry Station, Beltsville, Maryland; "Some effects of herbicidal oils on the physiology of plants" by W. H. Minshall, Central Experimental Farm, Ottawa, Ontario.

"Comparative activity of hormone-like substances as herbicides and their future possibilities with special reference to water weeds," by A. E. Hitchcock, P. W. Zimmerman and Henry Kirkpatrick, The Boyce Thompson Institute, Yonkers, New York; "Factors affecting the action of 2,4-D" by Charles Hamner, Michigan State College, East Lansing, Michigan; "Effect of temperature, organic matter, pH and rates of application on persistence of 2,4-D in soil," by M. W. Meadows and Ora Smith, Cornell University, Ithaca, New York.

"The role of physiological research in chemical weed control," by John W. Mitchell, Bureau of Plant Industry Station, Beltsville, Maryland; "A new chemical for use in pre-emergence weeding" L. J. King and J. A. Lambrech, Boyce Thompson Institute, Yonkers, New York; "The phytotoxicity of some alkylamine salts of 2,4-D," by Nathaniel Tischler, Sharples Chemicals, Inc., Palmyra, New Jersey.

Thursday's program will include papers on Horticultural Crops,

with B. H. Grigsby, chairman. Papers will be "Chemical weed control in horticultural crops at the Pennsylvania State College," by Charles J. Noll, Pennsylvania State College, State College, Pa.; "Control of grasses in raspberry plantations by fall, spring, and summer applications of sodium trichloroacetate," by R. F. Carlson and J. E. Noulton, Michigan State College, East Lansing, Michigan; "Control of woody plant weeds in blueberries with 2,4-D materials," by A. E. Prince, Maine Agric. Expt. Station, Orono, Maine; "Progress report on weed control in strawberries with 2,4-D," by Franklin A. Gilbert, Rutgers University, New Brunswick, New Jersey; "A progress report on chemical weed control in vegetable crops," by L. D. Danielson, Virginia Truck Expt. Station, Norfolk, Va.; "Greenhouse and field studies of herbicides and their use on vegetable crops," by E. K. Alban, Homer Swingle, Leslie McCombe and Webster Smith, The Ohio State University, Columbus, Ohio.

The afternoon session, with A. E. Prince, chairman will include presentation of these papers: "Chemical weeding of asparagus in relation to temperature and moisture index of environment to sunshine," by S. B. LeCompte, Jr., Rutgers University, New Brunswick, New Jersey; "Chemical weed control in sweet corn and asparagus in 1948," by E. M. Rahn and C. E. Schell, University of Delaware, Agric. Expt. Station, Newark, Delaware; "Productivity of cultivated and uncultivated Golden Cross Bantam sweet corn weeded with post-emergence spray of 2,4-D," by C. H. Dearborn, New York State Agric. Expt. Station, Geneva, New York; "The effect of various 2,4-D sprays on yield, quality and maturity of four sweet corn and three potato varieties," by E. K. Alban, Homer Swingle and Leslie McCombs, The Ohio State University, Columbus, Ohio; "Response of eight varieties of sweet corn to post-emergence applications of 2,4-D,"

by J. R. Havis and R. D. Sweet, Cornell University, Ithaca, New York.

"Sodium isopropyl xanthate as a new selective herbicide," by L. L. Baumgartner, Boyce Thompson Institute, Yonkers, New York and Benjamin Wolf, The G. L. F. Seabrook Farms, Bridgeton, New Jersey. "Pre-emergence chemical weeding of lima beans and cauliflower on Long Island," by Walter C. Jacob, Long Island Vegetable Research Farm, Riverhead, Long Island; "Effects of weed control sprays of salt, and salt and sodium nitrate on stand and yield of canning beets," by C. H. Dearborn, New York State Agric. Expt. Station, Geneva, New York. "Experiments on control of weeds in onions," by C. C. Filman, Ontario Agricultural College, Guelph, Ontario, Canada.

The morning session of Thursday, January 6, will feature papers on Agronomic Crops, Turf and Miscellaneous, with Dale E. Wolf, Chairman. These papers include "Control of weeds in potatoes by pre-emergence

sprays," by Ora Smith, H. W. Meadows and E. R. Marshall Cornell University, Ithaca, New York; "Chemical weed control in potatoes on Long Island," by Walter C. Jacob, Long Island Vegetable Research Farm, Riverhead, Long Island; "1948 results of weed control in potatoes with cyanamid and 2,4-D," by J. C. Campbell and D. E. Wolf, Rutgers University, New Brunswick, New Jersey; "One year's results from use of chemical herbicides on potatoes," by J. Stanley Cobb, The Pennsylvania State College, State College, Pa.; "Revolutionary changes in potato production as a result of weed control," by Ora Smith, E. R. Marshall and M. W. Meadows, Cornell University, Ithaca, New York; "Effects observed from use of 2,4-D in varied field trials," by John Van Celuwe and Anthony J. Tafuro, Coop. G.L. F. Exchange, Ithaca, New York; and "Two years results of pre-emergence weed control with Cyanamid," by Rodney A. Briggs and D. E. Wolf, New Brunswick, N. J.

The afternoon meeting will continue with H. B. Musser, Chairman. Papers scheduled are: "2,4-D for weeds in corn," by E. Van Alstine, Cornell University Ithaca, New York; "The morphological response of several corn hybrids to post-emergence applications of 2,4-D," by J. C. Anderson, Rutgers University, New Brunswick, New Jersey; "Three years results on pre-emergence in corn with 2,4-D", by D. E. Wolf and J. C. Anderson, Rutgers University, New Brunswick, N. J.; "Weed control in corn with 2,4-D and cyanamid," by S. M. Raleigh and R. E. Patterson, Pennsylvania State College, Pa.; "Chemicals for crabgrass control," by Ralph E. Engel, Rutgers University, New Brunswick, New Jersey; "Low pressure low volume spray equipment for applying 2,4-D and other herbicides to turf," by A. M. S. Pridham, P. B. Kaufman and E. B. Wahlgren, Cornell University, Ithaca, New York; "Weed control in turf by use of adopted species and good management prac-



VIRGINIA-CAROLINA CHEMICAL CORPORATION Home Office: Richmond, Va.

ices," by Marvin H. Ferguson, U.S. Golf Association, Green Section, Plant Industry Station, Beltsville, Maryland; "Low pressure, low volume spray equipment for applying 2,4-D and other herbicides to roadsides," by A. M. S. Pridham, P. B. Kaufman and C. W. Terry, Cornell University, Ithaca, New York; and "Controlling brush on utility right-of-way," by R. H. Beatty, American Chemical Paint Co., Ambler, Pa.

The morning of Friday, January 7, will feature a joint session, with Louis Evans, Chairman. Papers are to include "Combinations of chemicals for weed control," by Ora Smith, E. R. Marshall and H. W. Meadows, Cornell University; "Progress in the herbicidal applications of sodium pentachlorophenate and pentachlorophenol," by L. V. Sherwood, Monsanto Chemical Company, St. Louis, Missouri; "Preliminary report on Quack Grass (*Agropyron repens*) eradication with ammonium trichloroacetate and sodium trichloroacetate under field conditions," by A. R. Hodgdon, New Hampshire Agric. Expt. Station, Durham, New Hampshire; "Chemical control of Quack Grass," by S. N. Raleigh, Pennsylvania State College, State College, Pa.; "Methods and materials for out-state weed control demonstrations," by C. S. Garrison, Rutgers University, New Brunswick, N.J.; "The application of herbicides," by E. L. Barger, Iowa State College, Ames, Iowa; "The effect of chemical and flame weed killers on soil structure," by C. L. W. Swanson, Connecticut Agric. Expt. Station, New Haven, Connecticut.

At the meeting's final session, Dr. Ahlgren will be chairman. Papers prepared for presentation include: "Cyanamid and its derivatives for weed control," by Frank L. Stark, American Cyanamid Company, New York; "Effects of nitrogen level on reaction of soybeans to 2,4-D," by Dale E. Wolf, Rutgers University, New Brunswick, New Jersey; and "The phenolic herbicides, their characteristics and uses," by Keith Barons, Dow Chemical Company, Midland, Michigan.

The remainder of the after-

Nevins Joins Mathieson

Mathieson Chemical Corporation, New York, recently appointed S. L. Nevins as general manager of



S. L. NEVINS

its newly formed ammonia department. During the war, he served on the sulphuric acid and superphosphate advisory committees for the War Production Board and the Office of Price Administration, and since then, has been serving on the Industry Nitrogen Advisory Committee to the Department of Commerce.

Calif. Mosquito Ass'n Meets

The California Mosquito Control Association will hold its annual conference jointly with the American Mosquito Control Association at Berkeley and Oakland, February 6-9, 1949. The program will comprise discussions of topics of international, national and local California problems affecting mosquito control agen-

noon will be devoted to a business meeting, closing with a report of the policy committee. The annual banquet will be held on the evening of Thursday, Jan. 6 in the Grand Ballroom of the New Yorker. Speaker at this event will be Wheeler McMillen, editor of *Farm Journal*. His topic will be "All of Us."

Officers of the conference, in addition to Dr. Ahlgren, president, are: B. H. Grigsby, Michigan State College, East Lansing, Mich., vice-

president. Invitation is extended to all interested.

Williams Joins Associated

Paul Williams, associated with the Chicago sales office of John Powell & Co., and recently in charge of that office, joined the staff of Associated Products, Inc., St. Paul, on December 1. The latter company produces and distributes seeds, insecticides and other chemical and agricultural specialties.

Canadian Group Elects

A. M. Wilson, Field Crops Commissioner, Edmonton, Alberta, Canada, was elected Chairman of the Western Canadian Weed Control Conference at the group's second annual meeting at the Ft. Garry Hotel, Winnipeg, November 3-5. The new vice-chairman is Dr. W. G. Corns, Department of Plant Science, University of Alberta, Edmonton; and the new secretary is G. R. Sterling, Superintendent of Soil Conservation and Weed Control, Department of Agriculture, Edmonton.

Some 309 delegates from Canadian provinces and various sections of the United States were in attendance at the sessions held in the Fort Garry Hotel in Winnipeg. The program featured reports of extensive experimental work on weed control undertaken in western Canada during the 1948 season, with emphasis on the use of 2,4-D and related products. Provincial workers presented numerous progress reports on weed surveys and other phases of the general weed control program.

president; and Dr. R. D. Sweet, Cornell University, secretary-treasurer. The program committee consists of Dr. Benjamin Wolf, chairman; E. A. Prince, Maine Agricultural Experiment Station, Orono, Me.; and T. R. Cox, American Cyanamid Co., New York. Conference advisors include Louis B. Evans, U.S.D.A., Beltsville, Md.; Dale E. Wolf, New Brunswick, N.J.; and R. H. Beatty, American Chemical Paint Co., Ambler, Pa.★★

Innis Advances Hiller

Paul W. Hiller, special representative for Innis, Speiden & Co., 117 Liberty St., New York City, has been appointed manager of the company's newly-formed Products Development Department, it was announced recently by W. H. Sheffield, Jr., vice-president.

Mr. Hiller, who has been associated with the chemical industry for the past 31 years, has been with Innis, Speiden & Co. since 1919.

The new Products Development Department will coordinate work the company's three fields—chemicals, gums, waxes—previously carried on in each department. Particular emphasis will be placed on the developments of new products and processes.

An active member of the Salesmen's Association of the American Chemical Industry, Inc., Mr. Hiller is now secretary of that organization.

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**Crystals
Superfine
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Agricultural Chemicals Specialists

Vertical Mixer Bulletin

Sprout, Waldron and Company, Muncy, Pa., has issued a 4-page bulletin #VA-948 describing and giving complete dimensional data on the three standard sizes of its new Model "VA" vertical mixers. A copy can be had by writing the company.

Co-ops Meet in Minn.

Twenty-two farm supply co-operatives were represented at a November meeting in St. Paul, Minn., which had been called by the National Council of Farmer Cooperatives, Washington, D. C., to talk over fertilizer problems. Discussions were centered on granulation, conditioners, ammoniating and research plans. All of the co-ops were interested in production of high analysis fertilizers and the elimination of fillers from formulas.

Meetings

Amer. Ass'n. Economic Entomologists, New Yorker Hotel, New York, December 13-16, 1948.

Northeastern Weed Control Conference, Jan. 5-7, New Yorker Hotel, New York.

Michigan Insecticide, Fungicide Institute Meeting, Fairchild Theatre, E. Lansing, Mich., Jan. 11 & 12, 1949.

Custom Sprayer & Duster Short Course, University of Illinois, Urbana, Jan. 12-14, 1949.

National Canners Association (and Canning Machinery and Suppliers Association) January 14-21, Atlantic City, N. J.

Cotton States Branch, A.A.E.E.: Southern Weed Control Conference; Southern Agricultural Workers' Conference, Baton Rouge, La., Jan. 31, Feb. 1 & 2, 1949.

Western Weed Control Conference, February 3 & 4, Bozeman, Montana.

California Mosquito Control Association Conference, jointly with American Mosquito Control Ass'n., Berkeley and Oakland, Calif., Feb. 6-9, 1949.

South Dakota State Weed & Livestock Pest Control Conference, March 15 & 16, Aberdeen, S. Dakota.

Southern Shade Tree Conference, Thomas Hotel, Gainesville, Fla., March 23-25, 1949.

National Fertilizer Association, Greenbriar Hotel, White Sulphur Springs, W. Va., June 13-15, 1949.

AGRICULTURAL CHEMICALS

Frankenhoff Corp. Formed

The formation of a new corporation devoted to research, development and distribution of non-metallic minerals was announced re-



C. A. FRANKENHOFF

cently by C. A. Frankenhoff, president of the new organization. The firm, to be known as the Frankenhoff Corporation, will specialize in diatomaceous earth products.

A. G. Frankenhoff is vice-president of the corporation. Together, the two Frankenhoffs bring to the organization a broad base of experience in the industry. Offices of the new corporation are located in the Chrysler Building, New York City. The telephone number is announced as ORegon 9-3194.

Phytopath Meeting Dec. 6

A meeting of three days and two evenings was to comprise the fortieth annual meeting of the American Phytopathological Society meeting at the William Penn Hotel, Pittsburgh, on December 6, 7 and 8. Features of the convention were to be a number of discussions on plant disease and fungicides; reports on 1948 season experiments with fungicidal sprays and dusts; and the annual fungicide colloquium at which manufacturers of fungicides, diluents and adjuvants were invited to present products which are already on the market, or those contemplated for coming seasons. A full report of the Phytopath meeting will appear in the January issue of Agricultural

Chemicals. The 1948 officers of the APS are: president, R. S. Kirby, State College, Pa.; vice-president, W. D. Valleau, University of Kentucky; and secretary-treasurer, Curtiss May, U. S. Department of Agriculture, Beltsville, Md.

DuPont Appoints Weibel

The DuPont Company, Wilmington, has recently announced the appointment of Howard A. Weibel as assistant sales manager of its "Semesan" section, which handles seed disinfectants and turf fungicides. Mr. Weibel was a "Semesan" sales-

man in the Central-West and California, before his recent advancement.

Offers Insecticide Folder

Planetary Chemical Co., Creve Coeur, Missouri, has announced the release of a new greenhouse and nursery data leaflet on its product, "TET-200." The pamphlet presents data on the use of tetraethyl pyrophosphate for control of red spider and other mites, and of aphids. The names of 34 insect pests which are susceptible to the insecticide, are listed in the folder. Copies are available upon request.

2,4-D

2,4-Dichlorophenoxyacetic Acid
Sodium Salt

Triethanolamine Salt

Methyl, Isopropyl, Butyl Esters
40% Butyl Ester; 44% Isopropyl Ester

DDT

Dichlorodiphenyltrichloroethane

100% technical grade

50% Wettable Dust

25%, 30%, 40% emulsifiable solutions

ALPHA NAPHTHA- LENEACETIC ACID

and Methyl Ester

Kolker Chemical Works, inc.

80 LISTER AVENUE, NEWARK 5, NEW JERSEY

Manufacturers of Basic Agricultural Chemicals

Drew Offers Bulletin

The Oil and Chemical Division of E. F. Drew & Co., Inc., Boonton, N. J., has issued a bulletin on its products "Chlorsol" and "Base 401M." The former is a solubilizing agent for chlordane, and the latter an emulsifying agent.

"Chlorsol" is described as making possible non-flammable aqueous preparations of chlordane with no solvent odor. "Chlorsol" is a combination of polyoxyalkylene esters and sulphonates, the bulletin states.

"Base 401M" is fully described in the folder, with its functions, chemical nature, physical properties and application methods pointed out in detail. Copies of each folder may be obtained from the company's offices at Boonton, N. J.

Riedeburg to Hardy Co.

M. W. Hardy & Co., Inc., New York, has announced the appointment of Theodore Riedeburg as sales manager of the company's newly-created domestic sales depart-

ment. The Hardy company is a distributor of heavy and fine chemicals, vegetable oils and allied products.



THEODORE RIEDEBURG

Mr. Riedeburg was until recently, in charge of east coast operations for McLaughlin Gormley King, Minneapolis. Before that, he had been connected with Dow Chemical Co. and Westvaco Chemical Division of Food Machinery & Chemical Corp.

The domestic sales department of the Hardy Company, will represent chemical manufacturers in obtaining improved distribution of both regular line and specialty products.

Prentiss Folder Issued

R. J. Prentiss & Co., Inc., New York, have announced the publication of their technical bulletin No. 1, dated December, 1948. The bulletin describes the Prentiss products "Seedox 50" and "Seedox 50-W" for disinfecting and protecting seeds, bulbs and corms. A table of test results on vegetable and truck crop seeds is presented, with "excellent" treatment value attributed to use of "Seedex 50" on cotton, oats, sugar beets, peanuts, peas, red beets, cantaloupe, and watermelon.

The company states that "Seedox 50" is available as 50% dust for the 1949 season. "Seedox 50-W" will also be available as a 50% wettable powder, although the latter has not undergone as thorough testing as has "Seedox 50." The bulletin is available from the company's New York offices, 110 William Street, New York 7, N. Y.

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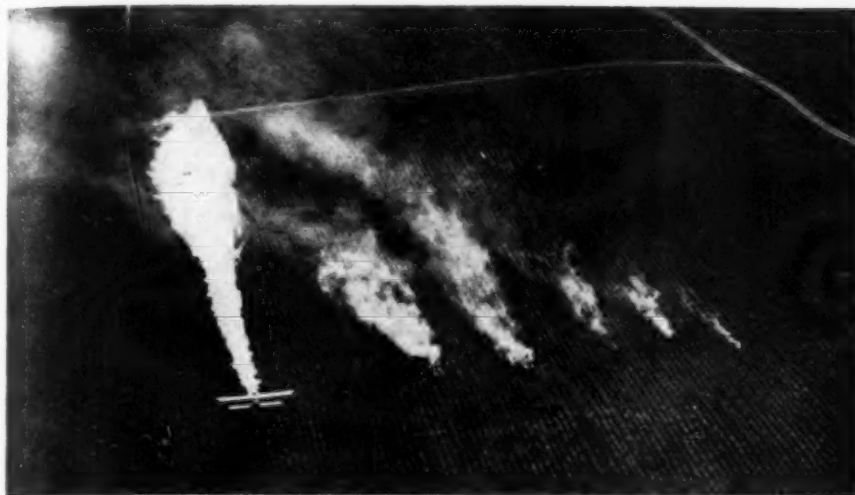
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Camera Catches 6 Types of Dusters at Once



Unusual aerial photo showing six types of dusting equipment in operation at one time. At the left is seen an airplane applying dust, and in addition (left to right) are the following: Power-

operated machine (gasoline, engine and tractor); traction power cart machine; 1-mule machine; saddle gun and hand gun. (U.S.D.A. photo)

MIFI Program Announced

The program for the Michigan Insecticide Fungicide Institute meeting was announced early in December by the group's officers. The dates for the two-day affair are set for January 11 and 12, the place is the Fairchild Theatre on the Michigan State College campus, East Lansing.

R. W. Tenney, M.S.C. Director of short courses will give the address of welcome on the first day, and Dr. Ray L. Janes, Extension Entomologist at M.S.C. will speak on livestock insect control. A session on pest control for small growers will be divided into four groups and discussed as follows: plant diseases, Dr. J. H. Muncie; Insects, Dr. Janes; Weeds, Dr. B. H. Grigsby; Extension, K. D. Bailey, Oakland County Agricultural agent.

The afternoon session will hear a discussion of brown rot control. Speakers are to include Dr. William B. Drew, M.S.C. professor of Botany; John C. Dunegan, U.S.D.A.; Don Barden, grower; Earl Steimle, dealer; Donald Cation, pathologist; Frank Sherman, entomologist; and Andrew DeKoningck, fruit handler.

"The Why, What, When and How of Pest Control Measures" is

the topic of a discussion to be held on the morning of January 12. Taking part in this portion of the program will be Drs. Grigsby, Muncie and Janes, and A. E. Mitchell, assistant professor of horticulture, M.S.C. A talk on legislation will be presented by W. E. Geagley, chief chemist, Department of Agriculture, Lansing.

Ray Hutson, professor of entomology, M.S.C., will be chairman of the final session of the meeting. Speakers will include Dr. Herman King, assistant professor of entomology, M.S.C., discussing "Adjuvants and their Uses." Dr. Edward Andrews, extension plant pathologist, M.S.C.; and Dr. Janes will talk on "Replacement Fungicides and Insecticides for 1949;" and Dr. Grigsby will present a paper on weed killers.

WEED CONFERENCE

(Continued from Page 38)

McNew, chairman; Educational problems in weed control, E. P. Sylwester, chairman; and regulatory problems in weed control, W. L. Klatt, chairman. The meeting was to round out with announcements, recommendations of the research committee, and announcement of next year's meeting place and time.

INSECT SPECIALISTS

(Continued from Page 24)

placed DDT in some usages, and can be applied in place of arsenate of lead, nicotine and some summer oils in specific insect controls. It kills a wide variety of tree insects as well as shrub, flower and vegetable garden pests, leaves a gloss on both petal and leaf and is harmless to warm-blooded animals.

One of the greatest dangers in plant injury is combining insecticides, which many home gardeners, even misinformed tree workers sometimes do. It is done too often without heed for possible effect on vegetation. Probably the No. 1 factor in the plant injury offenses is free arsenic, which is often liberated when arsenicals are combined with certain other chemicals.

So far as shade trees are concerned, the entomologists have gone further in pest control by spraying than have plant pathologists. There is a great need for more research in fungicidal sprays for shade and ornamental trees. Despite the number of new fungicides on the market, Bordeaux remains the standard fungicide for shade and ornamental tree use, and the sulfurs are still the standard for fruit trees.★★

BOOK REVIEW

(Continued from Page 45)

ments are unfortunate not only in themselves, but also because their existence might cause one to question other perfectly correct statements.

On the whole, however, the book contains a wealth of useful information and deserves a place in the library of every worker in the insecticide field.

—L. B. Norton

SUPPLIER'S BULLETINS

(Continued from Page 47)

that seeds treated with the carrier require no special bags for handling, storing, or shipping; that the carrier wets and coats the fungicide dust particles, causing them to remain in a stable suspension. Other properties

MUL-SI-MO

An Emulsifier of Petroleum Oils

Economical - Effective

MUL-SI-MO is especially adapted for the rapid emulsification of Oils whose viscosity is 120 Saybolt or less.

RANGE COVERED

Oils with a viscosity of 120 Saybolt or less cover the great majority of oils used in Dormant and Summer Sprays.

GENERAL TEXTURE

Mul-si-mo is a thin amber-colored oily liquid about the same viscosity as Kerosene Oil.

METHOD OF USE

There is nothing complicated about the use of Mul-si-mo. It is just poured into the oil to be treated at the rate of $\frac{1}{2}$ to 1%, depending upon the tightness of emulsion desired—then thoroughly stirred—and the process is completed.

RESULT OF MIXING AS ABOVE

A practically 100% Oil Product—No Water—No Soap—No Potash nor other Alkalines.

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Mul-si-mo is Neutral. Mul-si-mo-Made Emulsions are not adversely affected by pronounced

saline, alkaline or acid re-acting waters.

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Mul-si-mo, we believe, is the cheapest and most economical Emulsifier on the market for the emulsification of the oils above specified.

NON-TOXIC TO PLANTS

Extensive tests have shown Mul-si-mo to be non-toxic to plants when used at a dilution of 1 to 100. (Plants used in tests —Coleus.) As summer oils are usually used at the dilution of half-gal. to 100 gals. water, at such dilution the rate of Mul-si-mo to water would be 1 to 20,000.

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Per Gallon \$4.00; 5 Gallons and up @ \$3.75 per Gallon; 50 Gallon Drums @ \$3.50 per Gallon, f.o.b. New York or Jersey City. (Above prices for U. S. only. Foreign prices on request.)

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Absolutely Non-Abrasive and Adheres Readily to Foliage and all Surfaces.

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- Packed in 50 lb. valve bags.
- 20 ton lots. Lowest prices on West Coast. F. O. B. plant.
- Smaller quantities if desired



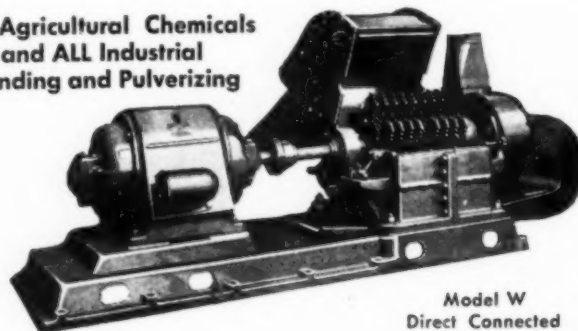
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ANYTHING

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Whatever you grind . . . JAY BEE Mills solve your problems with notable efficiency. Strength, durability and precision of operation are combined to give you a maximum of continuous operation, capacity and quality grinding at a minimum cost.

JAY BEE Mills, result of over 25 years of manufacturing experience, are made in many sizes and models . . . 12 to 200 H.P., for Belt, V-Belt or Direct Connected drives . . . for every grinding and pulverizing purpose. It will pay you to write for details.

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Franklin, Tennessee

of the carrier are described as adherence to the seed coat, freedom from dust, elimination of caking and ease of mechanical handling. The carrier is non-leaching and washable, and makes possible a reduction of the amounts of fungicidal material needed, the company says. Detailed information is available from the company's Chicago office.

GUEST EDITORIAL

(Continued from Page 21)

writing general condemnations, critics of the industry will gather and take cognizance of all the facts and data of which there is a vast amount. The industry associations of AIFA and PII can be of great assistance in furnishing much factual information. It behooves industry to strengthen itself by closer amalgamation of its associations for more complete exchange of information and so it may present a stronger and more united front on these problems.

Industry is proud of the scientific advancement it has made. It has

kept pace with American progress. True, new developments create problems—so did the railroad, the automobile and the airplane, to say nothing of jet propulsion. The American Way is to study and solve these problems and to go forward. Industry is anxious to do this, and it is hoped that all allied interests will work constructively with industry for progress.★★

STATION DIGEST

(Continued from Page 36)

mending this practice generally. Experimental results showed that relative effectiveness of commercial formulations of 2,4-D are directly proportional to the amount of 2,4-D parent acid contained. There was some indication that ester formulations give more rapid kill of plants, says the report, which adds that they have also proved more hazardous than other types of 2,4-D used as selective sprays on crops.

Weeds, continues the report, "are more susceptible to 2,4-D when applied at a time when plants are

growing most rapidly. Best results have been attained generally, when sufficient soil moisture is available to promote active plant growth. High temperatures at time of spraying reduce effectiveness, while low temperatures retard the action of 2,4-D but do not affect ultimate results."

Rhode Island Tests

INVESTIGATORS at Rhode Island Agricultural Experiment Station, Kingston, R. I., have recently turned their attention to development of fungicidal and insecticidal aerosols for greenhouse and home garden use, after noting the success of these bombs in controlling household pests.

In a progress report included in the station's 1947 annual report of its activities, it was announced that suitable techniques and equipment were developed for studying the miscibility of pesticides in propellants; the compatibility of formula components; the injuriousness to plant foliage; and ability to control fungi and insects.

What's Your Problem?

Aphid Spray
•
Nicotine Base
for Dust
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Controlling Poultry
Roundworm
(*Ascaridia galli*)
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Delousing
Poultry
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Dip and Drench
for Sheep, Goats
•
Control of Certain
Cattle Lice
•
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Surely Has The Answer—In These Products Identified by the Renowned

BLACK LEAF

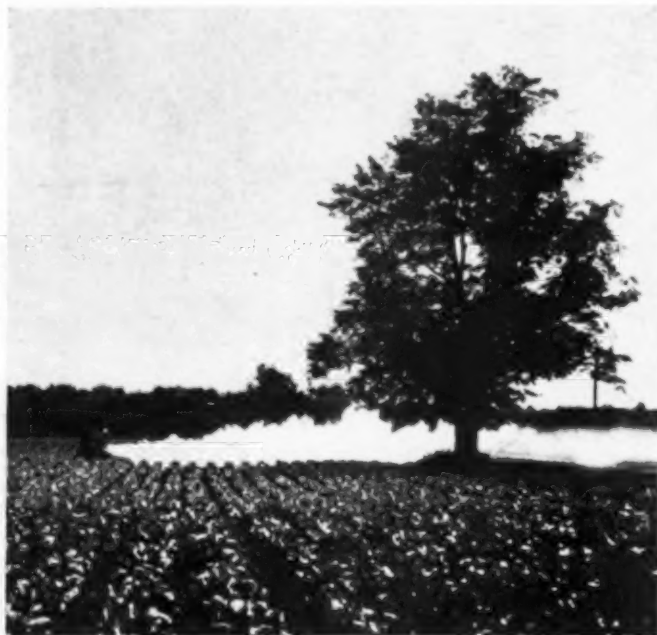


1. The FAMOUS BLACK LEAF 40—for spraying or dusting to control small sucking insects, plant lice, and similar pests. Also used to control external parasites of cattle, sheep and poultry—and as a drench for sheep.
2. BLACK LEAF 155—for spraying apples and pears to control codling moth, also for controlling grape berry moth.
3. BLACK LEAF DRY CONCENTRATE—used as a spray or dust—a dry powdered nicotine compound for easy mixing and handling.
4. BLACK LEAF 155 WITH DDT—for spraying apples and pears for the control of codling moth, leafhoppers, and similar pests.
5. BLACK LEAF 10 DUST BASE—meets the demand for a nicotine compound easily mixed with non-alkaline carriers to make a neutral dust.
6. BLACK LEAF CUNIC DRENCH—for sheep and goats. Formula recommended by U. S. Department of Agriculture.
7. BLACK LEAF POWDER AND PELLETS—for controlling the large roundworm (*Ascaridia galli*) in chickens.
8. MASH-NIC—for mixing with poultry feed to control large roundworm.
9. NICO-FUME LIQUID—for greenhouse spraying and fumigating—especially refined.
10. NICO-FUME PRESSURE-FUMIGATOR—spreads penetrating fumes under pressure—controls aphids and similar insects in greenhouses.

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TIFA IS THE IDEAL APPLICATOR



DEATH-DEALING FOG FOR INSECTS

- Compact, streamlined, mechanically improved, the 1948 model TIFA is more efficient, more economical, easier to handle.

Exhaustive tests have proved that TIFA does its work faster, with less manpower and materials.

An effective tool on farms, ranches, dairies and in industry . . . a health necessity in recreational areas, on garbage and fill dumps. TIFA can be used for inside or outside work . . . applies newly developed as well as older type chemicals of *selected particle size in a true fog*.

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TAMPA, FLORIDA

Fundamental information, says the report, was obtained on the relationship between the concentration of toxicant in the high pressure bomb and the effect of aerosol particle size on the deposition and residual fungitoxic action. A method was found for increasing the deposit of particles on surfaces in various planes. Promising fungicidal aerosols were also formulated, containing either an organic copper compound, a halogenated saturated hydrocarbon, or a quaternary ammonium derivative as the active ingredient. Summing up accomplishments, the report states that experiments indicate that when as little as 0.23 percent of a surface is covered with aerosol droplets, the germination of fungus spores is inhibited completely. Protective aerosol deposits, it is also noted, are often resistant to washing off because of their low solubility in water.

Of interest to manufacturers of agricultural chemicals is also another observation in the Rhode Island station's report concerning an investigation of pesticidal dusts. "Insecticides and fungicides in wettable powder form," says the report, "are becoming popular with manufacturer and user alike. In the past, the practice has been to add from 1/2 percent to 5 percent of a wetting agent to the formulation, so it would readily wet and mix with water. In the course of pesticide development studies it was found that when a fuller's earth (attapulgate) was used as the diluent, no surface active adjuvant was necessary. The inherent wettability of the inexpensive attapulgate clay carrier may prove valuable to processors of agricultural chemicals."

Among numerous other by-products of research at the Rhode Island station was the development of laboratory apparatus which distributes a known quantity of spray fluid evenly over a given surface area. This was used in an investigation of the effect of certain surface active agents on toxicity of contact insecticides applied directly to the insect's body. Some important conclusions were drawn which are detailed in the report.

At the Amherst home of

Massachusetts Agricultural Experiment Station, investigators expressed a notable lack of enthusiasm for eight different seed disinfectants which were used to ascertain the comparative tolerance of seven varieties of seed potatoes to treatments and also their effectiveness in controlling rhizoctonia and scab.

Preharvest spraying of onions with six listed commercial products which it was claimed would control storage rot, the Massachusetts report states, "did not give any control." More positive approval, however, is expressed of results from use of various insecticides for control of particular pests of different vegetables and flowers.

After detailing work done on different experiments, the report states that DDT "is very effective against the major insect pests of potatoes." "Black Leaf 40" and derris sprays, used against onion thrips "gave consistently high control in all cases," while "Ryanex," DDT and "DDD" sprays also proved effective (about 90 percent control). DDT and "DDD" were found superior to the other sprays in residual effect, allowing no increase in thrips population for seven days following application.

Of the dusts, "Multicide," and "Multicide" plus pyrethrum, gave a consistently high degree of immediate protection and good residual effects. Sabadilla also gave good control but appeared to have little residual value. "Ryanex" dust killed slowly but furnished good lasting effect. Other details are given on use of various insecticides for control of squash vine borer, cabbage maggot, plum curculio, celery plant bug and grape cane girdler.

For control of red spider mites on greenhouse roses, two commercial brands of hexaethyltetrphosphate solution were used in dilutions recommended and, says the Massachusetts report, gave excellent control but caused some injury to foliage and stunted the growth of petals on the outside of rosebuds. Neither product appeared to have been better than the other and the report further adds that they were "equally effective and caused similar plant injury."

About 1,000 acres of carrots and parsnips were kept free of weeds in Massachusetts during 1946 by use of Stoddard solvent, the Massachusetts report says. This compound killed such crops as beets, spinach, beans, corn, cabbage, lettuce and onions, except where applied to the ground before the plumules emerged. A number of chemicals, (not listed) were, however, found to show promise as pre-emergence sprays of these crops. Regarding 2,4-D, the report states that it was "most damaging to all vegetable crops except corn." And, in the case of corn, there was no appreciable damage only when applied just after the corn was planted.

At Virginia Agricultural Experiment Station, Blacksburg, Va., researchers concluded, as expressed in the 1947 annual report, that "DDT is the most effective insecticide ever used against the codling moth." Also endorsed was use of DDT for control of tobacco flea beetle. This compound and benzene hexachloride were effective in reducing the number of oriental fruit moths in apple orchards, but it was found that both compounds also killed helpful parasites.

New miticides used with DDT sprays gave varying degrees of mite control on apple trees, in some cases being even more effective than any materials previously recommended or tested. But the Virginia investigators expressed the feeling that more work needs to be done with these compounds before their practical value can be assured. Three new compounds in particular were mentioned as "promising"—namely dichloro-4-nitro phenyl thionophosphate; dichloro-phenoxy methane; and dioctylphthalate.

Staples to Connecticut

Connecticut Agricultural Experiment Station, New Haven, has announced the appointment of Robert Staples to its entomology department. He will do research work on the ecology and control of wireworms, to fill the vacancy caused by the recent resignation of Dr. Douglas Greenwood who has joined the staff of the Virginia Truck Experiment Station. Mr. Staples has recently

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completed graduate work at Cornell University, Ithaca, N. Y., from which he will receive his doctorate in February, 1949.

PLANT TESTING

(Continued from Page 43)

rate. Other indexes were 100 for benzene hexachloride at 99 pounds; 100 for DDT at both dosages; 92, 88, and 93 for Parathion at 11, 33, and 297 pounds respectively; 96, 81, and 100 for chlordane at the various dosages from 11 to 297 pounds; 96 at 33 pounds and 100 at the other dosages for chlorinated camphene. There was some indication of phytotoxicity in plots treated with chlordane, Parathion, and benzene hexachloride at the higher rates.

Some chemicals applied to the soil are known to affect taste and odor of plant products. Snap beans from the plots treated with the highest dosage of each chemical were steamed in cotton-plugged flasks; those from plots treated with benzene hexachloride or chlordane had a definitely disagreeable odor, while after cooling and storage for 24 hours the disagreeable odor of benzene hexachloride was still evident.

About four months after treatment, after the beans and okra were removed, two rows of cowpeas were planted on each plot. In early October marked differences were apparent in vigor, size, and number of plants on the various plots. A rating of relative stand and vigor was made on each plot, on a scale of 0=no plants, 1=very poor stand of plants about 2 to 3 inches high, and 10=excellent stand of healthy plants about 12 inches high. The average rating for the untreated plot was 0.9. At the lowest dosages most treated plots averaged about the same as the untreated. However, the rating was 4.0 or above for Parathion at 33, 99, or 297 pounds per acre; for benzene hexachloride at 99 pounds; and for chlordane and chlorinated camphene at 297 pounds per acre. Examination of the cowpea roots showed that these differences were not the result of root-knot, which was quite severe on practically all the plots.

DECEMBER, 1948

African Violet Nematodes

A. C. TARJAN and C. E. Cox of the University of Maryland report that, of four African violet plants showing stunting and leaf wilt symptoms, two were found to be infected with the meadow nematode, *Pratylenchus* sp., and one with the root-knot nematode, *Heterodera marioni*.

The meadow nematode was found on two plants of the "Ionantha" variety. The basal foliage was wilted with the long, limp petioles or leaf stalks hanging over the edge of the pots. The younger leaves were more upright than normal and the leaf blades had failed to expand normally, giving the plants a dwarfed appearance. The root system was stunted and the brownish discolored and partially decayed roots were characteristic of meadow nematode injury.

The root-knot nematode was found on a plant of the "Plum" variety that showed a compact dwarfed habit of growth, with pronounced downward curling or rolling of the leaf margins, and wilting of the basal leaves. The petioles and foliage were not so limp, however, as in the case of the meadow nematode infected plants. The roots were dwarfed with brownish discoloration. The galls, or root knots, on the roots were small. There was marked proliferation of short lateral roots, especially in the vicinity of the galls.

Deterioration by Nematode

L. W. R. JACKSON of the George Foster Peabody School of Forestry at Athens, Georgia, reports that a parasitic nematode, *Cricconemoides rusticum*, has been found associated with the deterioration of the fine roots of potted shortleaf pine seedlings. These were in soils from 3-year-old field stands of pine with heavy prevalence of the serious littleaf disease. The nematodes were also found on the fine roots of unthrifty shortleaf pine collected from two stands near Athens. According to the results of Dr. Jackson's study, the important foliar decline of pines in the southern pine region may be caused primarily by root-invading



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nematodes. The group to which this species of nematode belongs contains widely distributed parasites of the roots of trees and other plants. This species itself had previously been reported as having been found on tree roots in Austria and Switzerland and in soil in Germany and Roumania, in Washington, D.C., and at one place in Georgia.★★

•
Holly Chemical Co. Formed

Morris K. Perinchief has announced the establishment of the

Holly Chemical Company at Mt. Holly, N. J. The new company will manufacture and distribute agricultural sprays and dusts as well as industrial chemicals. The company's office is located at 315 Broad Street, Mt. Holly. The telephone number is 650.

Mr. Perinchief was formerly eastern salesman in the Agricultural Chemicals Division of Pennsylvania Salt Manufacturing Co. for a number of years. Later, he was sales manager for the Virginia Smelting Co. at

West Norfolk, Va. Most recently, he was connected with Scientific Soil Products, Inc., New York, as sales manager.

•
Co-op Warns on Sanitation

Cooperative G. L. F. Exchange, Ithaca, N. Y., is advising farmers to "go slow" on use of quaternary ammonium compounds for dairy plant sanitizing. Although admitting that their effectiveness is outstanding, the co-op asserts in an advisory bulletin to members, that: "As with so many

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new products, they have been placed on the market before sufficient work has been done to prove their worth."

Experimentation has demonstrated, the statement continues, that use of the quaternaries allows a build-up of a film so that the resulting unclean condition of equipment can contribute to a high bacteria count in the milk.

COMMENTS

(Continued from Page 39)

not. Placement is influenced by the amount of available moisture.

The Silver Anniversary Banquet was preceded by a cocktail party given by Balfour, Guthrie and Company, Ltd. Weller Noble, master of ceremonies of the banquet, introduced honored guests and charter members, and reminisced about by-gone days. He reviewed the early history of the Association, and introduced several original members who were present. These included T. W. Houser, C. W. E. Smith, Paul Pauly, CFA Secretary, George P. Bloxham, and Sidney Herzberg. Horace Dunbar and James M. Webster were at Riverside but are now retired. C. T. Prindeville, Swift and Company, Chicago, Illinois; Fred Lodge, National Fertilizer Association; and Dr. J. A. Camp, authority on citrus, were also present. Mr. Noble stated that sales of commercial fertilizers in California had increased ten-fold in 25 years. In 1947 California led all states of the Union in consumption of nitrogen, was fourth in phosphoric acid and tenth in potash.

Both morning and afternoon sessions of October 19th were held in the famous Galleria. The address of welcome was given by Dr. L. D. Batchelor, Director, Citrus Experiment Station, Riverside, who then discussed some of the present problems. He spoke of insects which may spread the virus of quick decline of citrus and the search for resistant root stock. He stated that small sizes of oranges are now the number one problem, and it is tied in with devitalized trees. Dr. Batchelor continued with a discussion on insecticides and their relation to good crop yields.

Minutes of the CFA 24th

annual meeting were read by the secretary, Paul Pauly, followed by a paper entitled, "My Twenty-five Years in Agriculture in California" by Dr. Wallace MacFarlane.

C. B. (Chet) Moore, secretary and managing director, Western Growers Association, responded to the topic "Quantity and Quality Production Essential to Western Growers." He discussed the tremendous vegetable industry of California and Arizona where in 1947 the vegetable shipments, not including potatoes, were 187,000 carloads, worth \$344,000,000.

F. R. Wilcox, assistant general manager, California Fruit Growers Exchange, discussed "Quantity and Quality Production Essential to Citrus." After telling of the difficulties, he said, "Citrus is not on its way out." It is a stabilized industry which has been standardized for ten years, he said. There are 300,000 acres of all varieties of citrus and few new plantings. Our goal is more fruit of improved quality per acre.

Dr. Hans Jenny, Professor of Soil Chemistry, University of California, responded to the subject "Fertility Levels of California Soils as Revealed by Pot Tests." He stated that pot tests are a good tool for evaluating nitrogen and phosphorus.

Dr. A. D. Shamel, University of Illinois '98, Emeritus, Riverside, gave an address entitled "Fifty Years of Observation on Fertilizer Practice." He stated that two acres of land are required to provide food and clothing for each person. He reminded that there are four billion acres of arable land in the world, and population is rapidly approaching the two billion mark. Science and improved procedures may improve this relationship. He mentioned the development of new and improved varieties by plant breeding, more complete control of insects and plant diseases, extension of irrigation, better farm management practices, mechanical aids, better food storage, changes in food habits "synthetic" food, conservation of soil fertility and scientific use of soil amendments and fertilizers.

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Since 1903 potash has been used on tobacco to improve burning of the leaf, which is the first instance of fertilization to influence a particular property of a plant. He pointed out that California's problems are complicated by some 1,100 soil types on the 100,000,000 acres of agricultural land. Only cooperation of all interested persons can solve the problems, he stated.

C. T. Prindeville, Swift and Company, Chicago, discussing "Why We Are Here" said that trade organization is conceived to settle an accumulation of perplexing problems facing an industry. He took exception to laws which put the Government in the position of a competitor to business.

M. E. McCollam, American Potash Institute, presented the report of the soil improvement committee, preceding Dr. George D. Scarseth, Director of Research, American Farm Research Association, LaFayette, Indiana, who gave an address on "Fertilizers, Food, Fun, Freedom and the Future." He said that organic matter is the storehouse of soil fertility. Intense cultivation and cropping consume quantities of food energy, food for bacteria, and otherwise deplete the soil. In some areas where farmers have a reputation for following good practices, they are actually mining the soil. From 1830 to 1900, fertilizer consumption doubled and it may be expected to double again by the end of the next seventy year period.

Food producers in the U.S. comprise 20% of the population as compared with 80% in India. The U.S. has the capacity to improve yield and to reduce the number of food producers to only 10%.

Dr. Oliver E. Overseth, CFA Executive Secretary and Manager, in his report expressed appreciation of the unity and support of members. He reported improved relations with related groups, and stated that the association is on firm ground.

Vice President Earl R. Mog was elected president and J. M. Quinn vice-president. To the other elective offices, Paul Pauly, secretary, and Grover Dunford, treasurer, were re-elected.

The sessions at the Mission Inn, Riverside, closed with a dinner, floor show, and dance in the main dining room. The dinner was preceded by a cocktail party given by the American Potash and Chemical Company.

POTASH

(Continued from Page 28)

vary widely from state deliveries.

Yet despite this record of production and distribution, there are potash demands that remain unfilled.

Several factors are responsible for this. Foremost is the tremendous increase in gross-farm income, in 1947 reaching the record total of \$30.5 billion. This is more than three times the gross farm income of \$9.4 billion in 1938. It is a matter of statistical record that the farmer's expenditures for fertilizers rise and fall with his income and in a close ratio thereto, which is to say that he habitually spends for fertilizers so many cents out of each dollar of income, varying widely between agricultural areas. For example, the Southeastern farmer spends 16 cents and the Midwestern grower 3 cents. With an income of such dimensions resulting from the increasing demands and sustained high prices for farm products since the beginning of World War II, the farmer has had funds wherewith to purchase plant-food material more nearly in the quantities and of the grades he has been taught to use by his agronomic advisers.

In recognition of this economic rule, other segments of the fertilizer industry have greatly expanded their output and have applied an increased percentage of that output to the preparation of mixed goods.

Effect of Education

EDUCATION has become a further important factor accounting for this phenomenal increase in potash consumption—education based on research and field demonstration imparted to the farmer by Federal and state agricultural agencies.

Among the most effective educational devices has been the widespread adoption of diagnostic techniques for determining the fertility of soils and the nutritional status of growing crops. Principal among such tests are those provided largely by state laboratories to which farmers can send their soil samples for analysis. These reveal the presence, or more frequently the absence, of potash in adequate supply in forms available for crop nutrition, thus providing authentic information for the farmer's guidance.

Related thereto is an increasing knowledge of what constitutes the balanced nutrition of the major crops. In applying this knowledge as a diagnostic technique, the crop is "sampled" by the collection of leaves or other parts which are analyzed for their plant-food content.

Contributing also to the increase in potash consumption has been the changing pattern of American agriculture which has an interest in soil conservation and in the adoption of the various practices that contribute to it. Somewhat related thereto is the fertilized pasture program, particularly in the South; where this program is being promoted as an important phase of diversification to relieve dependence on cotton and the one-crop system.

Among the changing patterns, mention should be made of new practices in growing corn, where fertilization applied to adaptable hybrids, can yield more than double the averages obtained by old practices.

In this new development increased applications of compounds of nitrogen are the major feature although the balanced ratio of potash is likewise essential. Mention should be made likewise of the new results in the development of chemical pesticides, enabling the farmer more effectively to control pests which reduce profits.

All these and other phases of the changing pattern, render the farmer less vulnerable to unfavorable changes in the economic pattern and lend stability to the fertilizer and other industries dependent upon him as the consumer of their products.

Industry Patents

The following patents have recently been issued by the U. S. Patent Office on products and devices in the agricultural chemical field. Copies of the patents may be obtained at 25c each by addressing the U. S. Patent Office, Washington 25, D. C.

2,451,645. FUNGICIDAL AND BACTERICIDAL COMPOSITIONS CONTAINING 1-(4'-ISOPROPYLBENZYL)-PIPERAZINE. Patent issued October 19, 1948, to Ferdinand B. Zienty and George W. Steahly, St. Louis, Mo., assignors to Monsanto Chemical Co., St. Louis. A fungicidal and bactericidal composition comprising a substance selected from the group consisting of 1-(4'-isopropylbenzyl)-piperazine and its acid salts, and a carrier.

2,452,429. FUNGICIDAL COMPOSITIONS. Patent granted October 26, 1948, to Paul J. Carlisle, Wilmington, Del., and Wilbie S. Hinegardner, Niagara Falls, N.Y., assignors to E. I. duPont de Nemours & Co., Wilmington. A fungicidal composition comprising a mixture of paraformaldehyde and a chlorine derivative of trimethyl acetonitrile having the formula $C_3H_{(9-x)}Cl_x-CN$, where x equals 1 to 3.

2,452,759. INSECTICIDE CONTAINING METHYLATED NAPHTHALENE AND 4,4' DICHLORO-DIPHENYL TRICHOETHANE. Patent issued November 2, 1948, to Julius Hyman, assignor to Velsicol Corporation, Chicago. An insecticide containing as active ingredients an insect toxic proportion of methylated naphthalene and 4,4' dichloro-diphenyl-trichloroethane.

2,453,076. CRYSTALLIZATION OF DDT. Patent issued November 2, 1948, to Kenneth B. Little and John J. Burton, Easton, Pa., assignors to J. T. Baker Chemical Co., Phillipsburg, N.J. The process of solidifying DDT in hard crystalline form which includes cooling molten DDT

to a temperature not above about 60°C. without solidification, whereby a supercooled liquid is obtained, and permitting the supercooled liquid to crystallize.

Trade Mark Applications

PROPASOL, in capital letters, for chemical preparation for use as a fumigant and an insecticide. Filed Oct. 16, 1946 by Carbide & Carbon Chemicals Corp., New York. Claims use since 1935.

SOILMASTER, in capital letters for compound containing chlorobromethane for use in treatment and fumigation of soil for the control of nematodes. Filed Dec. 6, 1946, by Michigan Chemical Corp., St. Louis, Mich. Claims use since July 2, 1946.

BROMOFUME, in capital letters, for soil and grain fumigants. Filed July 5, 1947, by Eston Chemicals, Inc., Los Angeles. Claims use since Mar. 11, 1943.

BULCO, in heavy letters, for insecticides. Filed July 19, 1947, by W. H. Bull Co., St. Louis, Mo. Claims use since Aug. 31, 1938.

"TRI-BASIC," in capital letters, for copper fungicides. Filed Sept. 30, 1947, by Tennessee Copper Co., Copperhill, Tenn. Claims use since Aug. 20, 1937.

CHINCH-O, in capital letters, for insecticides. Filed Oct. 8, 1947, by Andrew Wilson, Inc., Springfield, N. J. Claims use since June, 1933.

E, the letter enclosed in oval, for insecticides. Filed Feb. 18, 1948, by Penola, Inc., Chicago. Claims use since May 26, 1947.

ESTON, in hand-lettered script, for fumigating compounds, insecticides, etc. Filed July 5, 1947, by Eston Chemicals, Inc., Los Angeles. Claims use since Mar. 1, 1946.

DIVERSEY, in outline capital

letters, slanting upward, for insecticide, disinfectant, and others uses. Filed Aug. 19th, 1947, by The Diversey Corp., Chicago. Claims use since Jan. 21, 1947.

TAPS, in white italic letters on black background, for insecticides. Filed Nov. 21, 1947, by Pacific Guano Co., Berkeley, Calif. Claims use since Jan. 1, 1935.

COMMANDO, in hand lettered style, slanting upward, for insecticides. Filed Jan. 23, 1948, by Mayfair Industries, Inc., Chicago. Claims use since June 12, 1947.

HEP, in caps and lower case, for insecticides. Filed Feb. 5, 1948, by Bostwick Laboratories, Inc., Bridgeport, Conn. Claims use since Jan. 3, 1948.

BIG CROP, in capital letters, for fertilizer. Filed July 12, 1947, by Armour & Co., Chicago. Claims use since Nov. 1, 1919.

ALPHATRON, in capital letters, for fertilizers. Filed Dec. 23, 1947, by Canadian Radium & Uranium Corp., New York. Claims use since Nov. 22, 1947.

INSECT-O-LITE, hand-drawn capital letters, for insecticides. Filed Apr. 14, 1947, by Avilite Inc., Burbank, Calif. Claims use since Feb. 6, 1947.

SHERWIN-WILLIAMS, in italic capital and lower case letters, for insecticides, fungicides, herbicides, pesticides, and intermediates. Filed June 24, 1947, by Sherwin-Williams Co., Cleveland, Ohio. Claims use since 1902.

SHADED LINES IN OVAL, for insecticides, herbicides, etc. Filed Nov. 12, 1947, by Michigan Chemical Corp., Saint Louis, Mich. Claims use since July 15, 1945, on insecticide in powder form; since Mar. 29, 1946 for herbicides; and since Nov. 29, 1946, on liquid insecticides.

PIONEER, in capital letters arranged in arch, for sulfur. Filed Dec. 8, 1947, by Stauffer Chemical Co., San Francisco. Claims use since Oct. 15, 1927.

Classified Advertising

Rates for classified advertisements are ten cents per word, \$2.00 minimum, except those of individuals seeking employment, where the rate is five cents per word. \$1.00 minimum. Address all replies to Classified Advertisements with Box Number, care of AGRICULTURAL CHEMICALS, 254 W. 31st St., New York 1. Closing date: 25th of preceding month.

Positions Open

Chemical Sales: A leading eastern chemical manufacturer requires services of young man with some experience in the industry to handle sales correspondence, follow-up salesmen's reports, assist sales manager generally. Excellent opportunity. Give full details, education and experience. Address Box 302, care of Agricultural Chemicals.

Entomologist Wanted: To head service department of large pest control firm with home office in Pittsburgh and branches in several cities. Candidate should have several years of field experience and preferably Ph. D. Duties would include handling sizable staff of service-men, training new men for pest control work, supervising insecticide formulations. This is a "big" job with unlimited possibilities. There is available a nice five-room, two-bedroom apartment at very reasonable rental. Submit complete data on training, experience, salary requirements and photo. Strictly confidential. Address: Mr. L. C. Crosby, President, Commonwealth Sanitation Co., 3567 Bigelow Blvd., Pittsburgh 13, Pa.

Require Graduate: Agricultural field. Require a graduate in basic agricultural plant sciences, preferably in entomology. Sales and service. Willing to travel. Car necessary. New product. National organization. Headquarters in Chicago. Salary plus expenses and car allowance. Real future. Address Box 303 care of Agricultural Chemicals.

Positions Wanted

Salesman: Age 39, responsible, capable, well established, 20 years successful sales experience covering Pacific Northwest states, past 4 years insecticide sales to dealers, wholesalers, commercial and industrial accounts, desires lifetime sales connection with strong future possibilities with manufacturer of insecticides, herbicides, fungicides or basic materials. Address Box 304, care of Agricultural Chemicals.

Position Wanted: Helicopter Pilot with PhD in Economic Entomology desires research position in aerial application of insecticides and fungicides. Five years field and laboratory experi-

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ence in testing insecticide and fungicide sprays and dusts. Available April, 1949. Address Box 305, care of Agricultural Chemicals.

Entomologist, Ph.D. Desires position in technical service with firm engaged in manufacturing or sale of agricultural chemicals. 12 years experience in fields of insecticides, fungicides, and herbicides with state and commercial agencies. Excellent references. Address Box 306, care of Agricultural Chemicals.

Horticulture or Entomology: Veteran desires work in Horticulture or Entomology. BS and MS degrees from Texas Agricultural and Mechanical College. Three years experience in landscape, vegetables and research and teaching. Age 25, wife and three children, prefer research. Will work anywhere. Present income \$6,000. I am a worker and have callouses on my hands to prove it. RT-1, Box 358-A, Bryan, Texas.

Miscellaneous

Equipment Wanted: One used, but in operating condition, insecticide dust mixer not exceeding 1000 lb. capacity. State make, condition, capacity and price first letter. Address Box 307, care of Agricultural Chemicals.

For Sale: Fungicide carrier stable solution. Use your preferred fungicide with our carrier. Distributors wanted. Frank J. Zink Co., Dept. A-6, 141 WW. Jackson Blvd., Chicago 4, Illinois.

DuPont Starts Test Farm

E. I. du Pont de Nemours & Co., Inc., Wilmington, Del. has acquired a farm near San Jose in the Santa Clara Valley of California on which the company will conduct experiments with agricultural chemicals. Known as the "San Jose Experimental

Station," the test farm will expedite research with chemicals for control of insects, parasitic diseases and weeds. Emphasis will be placed on development of formulations particularly suited to California. The experimental work done on the San Jose farm will be supplemented by the du Pont field laboratory at Yakima, Washington.

In charge of the San Jose farm will be Millard C. Swingle, Western area supervisor of Agricultural Product Development for the Grasselli Chemicals Department. He holds degrees from Ohio State University and the University of Maryland, joined du Pont in 1943 at Wilmington, and in 1947 was transferred to the West Coast.

F.F.A. Award to Woodrum

The Future Farmers of America have awarded to Clifton A. Woodrum, president of the American Plant Food Council, the degree of "Honorary American Farmer" in recognition of his many years of service in the field of agriculture. The award was made at Kansas City, Mo., December 15, at the group's 20th annual meeting which was attended by some 15,000 members from every state.

Mr. Woodrum was one of 36 nationally-known leaders in agriculture, industry and education who were honored. Others included Secretary of Agriculture Brannon, the French Ambassador to the U. S., and the Administrator of the Federal Security Agency.

Horticultural Report

Kansas State Horticultural Society has issued its biennial report for 1948. The book, edited by the society's secretary, George W. Kinkead, presents a number of papers reporting results from insecticides and fungicides in Kansas; fertilizers, soil deficiencies, plant disease, and cultural practices are all discussed. A report on recent developments in spray equipment is also included, with a summary discussing the advantages and disadvantages of several types of insecticidal application methods. The reports cover the 1946-1947 seasons.

Farm Chemical Use Pictured

Six colorful pages of the September issue of *Dow Diamond* are devoted to a discussion of chemicals for agriculture, describing the role played by insecticides, weed killers, and fungicides in producing and protecting agricultural crops. It points out that insects destroyed some \$600,000,000 worth of grain this year, and that this figure could be reduced greatly by putting into use knowledge already at hand for control. The article discusses the Government's educational program directed at agricultural areas, pictures many of the bulletins and posters issued by the U.S.D.A., and presents a two-page spread of pictures showing various agricultural chemicals at work. A limited number of copies are available without charge. Write to Dow Chemical Co., Midland, Mich.

Builds Fertilizer Plant

Consumers Cooperative Association, Kansas City, Mo., has purchased 28 acres of land at Muskogee, Okla., on which will be erected a \$200,000 fertilizer mixing plant, having a capacity of 25,000 tons of mixed fertilizer per year. Construction of the factory was to start at once, with completion set for late spring in 1949. The new plant will serve farmers in central and eastern Oklahoma.

Colo. Hort. Society Meets

A. F. Hoffman, secretary of the Western Colorado Horticultural Society has announced that the Sixth Annual Convention of the group will be held at Mesa College, Grand Junction, Colo., on January 7 and 8, 1949. The first day of the meeting, Jan. 7, will be devoted to discussions of interest to fruit growers, he states. The vegetable section will meet the next day. Included in the program of Jan. 8 will be the presentation of information on production of potatoes, dry beans and onions.

The annual banquet will be held at Lincoln Park auditorium on the evening of Jan. 7. Featured on this program will be the time-lapse motion pictures of plant growth, taken by John Nash Ott.

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(The Advertisers' Index has been carefully checked but no responsibility can be assumed for any omission.)



"Somebody's bin a lyin' to us, Cuthbert!"

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AGRICULTURAL CHEMICALS

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TALE ENDS

A WEEK after we predicted a higher price for DDT in a late issue, one basic producer boosted his price two cents per pound and the competition was not long in following. This should help our forecasting batting average, not too high up to this point.

* * *

We don't see why we can't go scientific in Tale Ends once in awhile and put in footnotes¹ just like all the important writers do. So,² we are adding footnotes to this piece to show that we know how to write long hair³ stuff too. We always liked footnotes because they are so compelling. It takes the strongest type of personality to read right over a footnote reference without pausing to glance at the bottom of a page.⁴ Isn't is annoying when a footnote is left out?

* * *

Spra-Comment, mimeographed monthly by Yuille Farm Service, Maysville, Mo., tells the story of a Texas farmer who has found a new use for his power sprayer. He sprays his combine, tractors and other farm machinery with kerosene inside and out. After letting the kerosene soak for three or four hours, he sprays the machinery with water at 400 pounds pressure. The water thus applied, cuts the kerosene-soaked dirt and grease. After the machine dries, the farmer gives it another light spraying with kerosene to protect the parts from rust. It is reported that after getting this treatment, machinery looks almost like new again.

* * *

Upon reading the accounts in this issue of meetings, past, present, and future in the agricultural chemical field, one can hardly avoid being impressed with the vastness of the industry, and the tremendous scientific progress being made. Also, from an editorial point of view, it presents a big job in trying to cover all, and to have staff representatives at as many meetings as possible. At this season, every staff member needs to be twins.

¹ Aren't footnotes fun?

² "So," a term loosely meaning "therefore."

³ See your local barber for further information.

AGRICULTURAL CHEMICALS



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Thousands of acres of cotton have been treated effectively with Toxaphene (Chlorinated Camphene) this year. Millions of boll weevils, leafworms, fleahoppers, aphids, grasshoppers, thrips and other harmful insects have been stopped in their tracks by this new cotton poison.

LOOK AT THE DAMAGE INSECTS DO*

- The estimated money value of crop losses to cotton insects in 1946 was \$283,595,000.
- This loss increased the cost of production almost to \$.06 per pound of lint.
- Loss in bales was 1,537,000 lbs., 613,000 tons of seed.
- This seed would have produced 200,000,000 pounds of margarine, or 179,000,000 pounds of shortening or cooking oil.
- The cottonseed meal and hulls would have produced 178,000,000 pounds of beef, or 500,000,000 gallons of milk.

From latest available statistics of the National Cotton Council of America.

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